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Federico Hernandez

May 2013

THE RELATIONSHIP BETWEEN READING AND MATHEMATICS ACHIEVEMENT OF MIDDLE SCHOOL STUDENTS AS MEASURED BY THE TEXAS ASSESSMENT OF KNOWLEDGE AND SKILLS

A Dissertation Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree

Doctor of Education

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Acknowledgement

As a seventh grade student I learned that, Mrs. Dorian, my history teacher was actually Dr. Dorian. I asked her about it and she said it is a Doctor, but in History, and I thought to my self, I want to do that but with math. It has been a long journey and I am honored to finally have accomplished my goal of attaining the degree, Doctor of Mathematics Education. I could not have completed this academic marathon with out the unconditional love and support from my family, immediate and extended. God has truly blessed me by putting such an amazing support group in my life. To my wife, Diana, and children, Celine, Adelina, Aracely, and Santiago thank you for your unconditional love and support and for always believing in me and supporting my efforts in my academic endeavors no matter the circumstances. To my parents, brothers, sisters, in-laws, nephews, and nieces thank you all for the added support and encouragement, it has always been acknowledged and highly appreciated as a priceless gesture.

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May 2013

THE RELATIONSHIP BETWEEN READING AND MATHEMATICS ACHIEVEMENT OF MIDDLE SCHOOL STUDENTS AS MEASURED BY THE TEXAS ASSESSMENT OF KNOWLEDGE AND SKILLS

An Abstract
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Abstract

The purpose of this study was to determine the strength and direction of the relationship between the three different levels of reading achievement on the Texas Assessment of Knowledge and Skills and the mathematics achievement of middle school students in a large urban school district in southwestern United States as assessed by the Texas Assessment of Knowledge and Skills.

A correlational research design was used to study this relationship. The participants were current high school students who were administered both the Reading and Mathematics sections of the Texas Assessment of Knowledge and Skills in their sixth, seventh, and eighth grade year in middle school (N = 652). A bivariate analysis using the Pearson product-moment correlation technique was used to determine the strength and direction of the relationship between the three different levels of reading achievement and mathematics achievement as measured by the Texas Assessment of Knowledge and Skills.

Students who achieved a Commended performance and a Met Standard performance in the Reading section of the Texas Assessment of Knowledge and Skills in sixth, seventh, and eighth grade, all yielded a correlation coefficient that was statistically significant with a p-value < .01. This also held true for the overall relationship in sixth (r = + .481 and N =652), seventh (r = + .537 and N = 652), and eighth (r = + .385 and N = 652) grade. These results suggest that there is a moderate to strong relationship between the reading achievement and mathematics achievement of sixth, seventh, and eighth

grade students who achieved a Commended or Met Standard performance on the reading section of the Texas Assessment of Knowledge and Skills.

The seventh grade students who achieved a Did Not Meet Standard in the Reading section of the Texas Assessment of Knowledge and Skills, N = 53, yielded a correlation coefficient, r = + .325, which was statistically significant with a p-value < .05. These results suggest that there is a moderate relationship between the reading achievement and mathematics achievement of seventh grade students who achieved a Did Not Meet Standard performance on the reading section of the Texas Assessment of Knowledge and Skills.

The sixth (n = 360) and eighth (N = 22) grade students who achieved a Did Not Meet Standard in the reading section of the Texas Assessment of Knowledge and Skills resulted in a correlation coefficient that was not statistically significant with a p-value > .05. This suggests that there is not a statistically significant relationship between the reading achievement and mathematics achievement of sixth and eighth grade students who achieved a Did Not Meet Standard performance on the reading section of the Texas Assessment of Knowledge and Skills.

The overall results of this study concur with the current body of literature in that there exists a relationship between reading achievement and mathematics achievement. The results from this study suggests that reading achievement has an important role in the mathematics achievement of middle students in high stakes testing, which is something that should be considered from the classroom all the way up to the top of the educational chain of command.

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Chapter I

Introduction

Reading is an integral part of the learning process across the curriculum. In most cases students are reading to understand and learn something in another discipline, such 8 as science, geography, or mathematics. Reading for understanding is commonly known 9 as reading comprehension, and it is the manner in which a significant part of the learning in public education takes place (Adams & Lowry, 2007). Regardless of the subject area, somewhere in the learning process the students are expected to read in order to learn. Reading comprehension plays an important role in the learning process, but it also plays an equally if not more important role in the assessment process of most academic core subject areas (Allington, 2001; Combs, 2002). Due to the strict regulations associated with most formal assessment situations, the student is one hundred percent responsible for reading the directions, the problem, and understanding and answering the question. This leads to speculation that success on any academic assessment is contingent on both the content knowledge and on the ability to correctly read and interpret the questions as well as directions on the assessment.

At the current time, public education in the state of Texas has recently initiated the process of transition from the *Texas Assessment of Knowledge and Skills* (TAKS) to the *State of Texas Assessment of Academic Readiness* (STARR). This is a process that has repeated itself about every ten years ever since the introduction of testing in the state of Texas. Each time the state has transitioned into a new assessment the purpose has been to raise the level of rigor and relevance of the assessment. In reference to the mathematics section, this has lead to the situation where almost the entire mathematics

assessment is in a word problem format. The word problem complexity has reached a level where the students being assessed must really be keen in their reading of the word problems in order to figure out exactly what needs to be done mathematically to answer the specified question. To demonstrate the word problem complexity a problem from the Mathematics section of the released April 2009 eighth grade *Texas Assessment of Knowledge and Skills* is provided below:

> The manager of a day-care center wants to serve ½-pint of milk to each of the 48 children at the center each day. She can buy milk in ½-pint cartons for $0.35 each, or she can buy 1-gallon containers of milk for $3.26 each. Which of these best represents how much the manager will save on milk each day if she buys the milk in 1-gallon containers?
>
> A.) $9.78
>
> B.) $2.76
>
> C.) $7.02
>
> D.) $2.91

The arithmetic necessary to solve this problem is basic multiplication and subtraction of numbers with decimal points and some basic division. Along with these basic mathematics skills the problem solver will also need to take into consideration the conversion fact that one gallon is equivalent to eight pints. The true essence of this problem lies not in the mathematics necessary to solve the problem, but rather in the process necessary for solving the problem. The process specifies the numbers to be multiplied, the numbers to be divided, the numbers to be subtracted, and how to utilize

the conversion fact of one gallon is equivalent to eight pints. To understand the process that will lead to the correct answer choice, the reader must read the problem to interpret and make sense of the problem situation and understand exactly the question being asked. In short, if the problem or question is, even slightly, misread or misinterpreted it could lead to an incorrect answer choice.

"Reading is fundamental" is a phrase that is often stated in reference to the basic importance of reading in everyday life. The significance of reading is heightened in the educational setting, due to the fact that reading is highly required in the learning and assessment process. Reading is foundational to the learning process, particularly as the process becomes more complex as the learning is advanced (Adams & Lowry, 2007; Allington, 2001; Combs, 2002). With regards to assessment, reading is crucial because reading is how the students navigate through and complete a particular assessment.

In these last few decades mathematics education has changed significantly (NCTM 2000), and these changes have reshaped the landscape of mathematics education across the nation. In *Curriculum and Evaluation Standards for School Mathematics* (1989) and *Principals and Standards for School Mathematics* (2000), the National Council of Teachers of Mathematics has made recommendations that have lead to this reshaping of the mathematics education landscape. Included in this reshaping of the mathematics educational landscape is the manner in which students are assessed in the state mathematics assessments. Over time the state mathematics assessments have significantly raised the rigor and complexity of the assessment items and have moved to more of a word problem format. Now more than ever, students' mathematics achievement on high stakes tests seem to be more dependent on their ability to read and

understand the problem as well as an understanding of the mathematics concepts being assessed.

The following sections in Chapter One will discuss the need for the study, the statement of the problem, the purpose of the study, the research question, the research hypothesis, the definition of terms, and the chapter summary.

Need for the Study

Research about reading comprehension within the realm of language arts is extensive; the same cannot be said about reading comprehension within the field of mathematics. The current body of research that connects reading comprehension and mathematics learning is mostly in regards to the context of strategies for mathematical problem solving. Other branches related to this research include students' interpretations of mathematical symbols, vocabulary specific to mathematics, and the reading comprehension of English language learners in mathematical problem solving (Fenwick, 2001; Love & Pimm, 1996; Osterholm, 2005). Very little research has actually studied the relationship between reading comprehension ability and how it may relate to achievement in mathematics (Hopkins, 2007). In this era of *No Child Left Behind,* and the extent of reading that is required on many state-mandated accountability mathematics achievement tests, gaining a better understanding of such a relationship could prove to be beneficial to both mathematics educators and mathematics students alike. Gaining a better understanding of this relationship could also help mathematics teachers, reading teachers, and building administrators better coordinate in the implementation of cross curriculum for the benefit of helping students become more successful in their state mandated assessments.

Statement of the Problem

The mathematics teachers of today face a formidable challenge in that they are held accountable for their students' performance on the yearly state-mandated mathematics assessment. As previously mentioned in this proposal, it is speculated that success on the state mathematics exam is contingent upon the student's ability to read and comprehend the items. There is little research that documents this relationship and current research suggests that more research should be conducted to further investigate the relationship between reading comprehension and mathematics achievement (Fenwick, 2001; Helwig, Heath, & Tindal, 2000; Lerkkanen, Rasku-Puttonen, Aunola, & Nurmi, 2005; Love & Pimm, 1996; Osterholm, 2005).

Purpose of the Study

The purpose of this proposed study is to determine the strength and direction of the relationship between the three different levels of reading achievement on the *Texas Assessment of Knowledge and Skills* and the mathematics achievement of middle school students in a large urban school district in southwestern United States as assessed by the *Texas Assessment of Knowledge and Skills*.

Research Questions

Inasmuch as the purpose of the proposed study is to determine the strength and direction of the relationship between the three different levels of reading achievement on the *Texas Assessment of Knowledge and Skills* and the mathematics achievement of middle school students in a large urban school district in southwestern United States as assessed by the *Texas Assessment of Knowledge and Skills*, the following research questions will be addressed:

1. What is the strength and direction of the relationship between the sixth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?
2. What is the strength and direction of the relationship between the sixth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?
3. What is the strength and direction of the relationship between the sixth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?
4. What is the strength and direction of the relationship between the seventh grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?
5. What is the strength and direction of the relationship between the seventh grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?
6. What is the strength and direction of the relationship between the seventh grade

students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?

7. What is the strength and direction of the relationship between the eighth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?
8. What is the strength and direction of the relationship between the eighth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?
9. What is the strength and direction of the relationship between the eighth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?
10. What is the strength and direction of the relationship between the reading achievement and mathematics achievement of sixth grade students as measured by the *Texas Assessment of Knowledge and Skills*?
11. What is the strength and direction of the relationship between the reading achievement and mathematics achievement of seventh grade students as measured by the *Texas Assessment of Knowledge and Skills*?

12. What is the strength and direction of the relationship between the reading achievement and mathematics achievement of eighth grade students as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypotheses

To explore the relationship between the three different levels reading achievement on the *Texas Assessment of Knowledge and Skills* and the mathematics achievement of middle school students as measured by the *Texas Assessment of Knowledge and Skills*, the following null hypotheses was generated from the research questions presented above,

Null Hypotheses

1. There is no statistically significant relationship between the sixth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
2. There is no statistically significant relationship between the sixth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
3. There is no statistically significant relationship between the sixth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

4. There is no statistically significant relationship between the seventh grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
5. There is no statistically significant relationship between the seventh grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
6. There is no statistically significant relationship between the seventh grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
7. There is no statistically significant relationship between the eighth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
8. There is no statistically significant relationship between the eighth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
9. There is no statistically significant relationship between the eighth grade students who achieved a "Did Not Meet Standard" performance in the Reading

section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

10. There is no statistically significant relationship between the reading achievement and mathematics achievement of sixth grade students as measured by the *Texas Assessment of Knowledge and Skills*.
11. There is no statistically significant relationship between the reading achievement and mathematics achievement of seventh grade students as measured by the *Texas Assessment of Knowledge and Skills*.
12. There is no statistically significant relationship between the reading achievement and mathematics achievement of eighth grade students as measured by the *Texas Assessment of Knowledge and Skills*.

Non-Directional Hypotheses

1. There is a statistically significant relationship between the sixth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
2. There is a statistically significant relationship between the sixth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
3. There is a statistically significant relationship between the sixth grade students who achieved a "Did Not Meet Standard" performance in the Reading

section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

4. There is a statistically significant relationship between the seventh grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
5. There is a statistically significant relationship between the seventh grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
6. There is a statistically significant relationship between the seventh grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
7. There is a statistically significant relationship between the eighth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
8. There is a statistically significant relationship between the eighth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics

achievement as measured by the Texas Assessment of Knowledge and Skills.

9. There is a statistically significant relationship between the eighth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
10. There is a statistically significant relationship between thee reading achievement and mathematics achievement of sixth grade students as measured by the *Texas Assessment of Knowledge and Skills*.
11. There is a statistically significant relationship between the reading achievement and mathematics achievement of seventh grade students as measured by the *Texas Assessment of Knowledge and Skills*.
12. There is a statistically significant relationship between the reading achievement and mathematics achievement of eighth grade students as measured by the *Texas Assessment of Knowledge and Skills*.

Definitions of Terms

To have a clear understanding of the proposed study, some of the terms used in this proposal must be clearly defined. The following words and terms are operationally defined as follows:

Texas Assessment of Knowledge and Skills (TAKS). The term "Texas Assessment of Knowledge and Skills test" refers to a high stakes criterion reference assessment that all students in the state of Texas must take. The *Texas Assessment of*

Knowledge and Skills is based on the state mandated curriculum, the *Texas Essential Knowledge and Skills* (TEKS).

State of Texas Assessment of Academic Readiness (STAAR). The term "State of Texas Assessment of Academic Readiness test" refers to a high stakes criterion reference assessment that replaced TAKS as of the spring of 2012. The State of *Texas Assessment of Academic Readiness* is based on the state mandated curriculum, the *Texas Essential Knowledge and Skills* (TEKS).

Texas Essential Knowledge and Skills (TEKS). The term "*Texas Essential Knowledge and Skills*" refers to the curriculum framework for Texas schools. As stated by the Texas Education Agency, the *Texas Essential Knowledge and Skills* identify what Texas students should know and be able to do at every grade and in every course in the required curriculum as they move successfully through Texas public schools.

Texas Education Agency (TEA). The term "Texas Education Agency" refers to the agency in the sate of Texas that regulates academic procedures in Texas. This means that The Texas Education Agency is responsible for the development and assessment of the *Texas Assessment of Knowledge and Skills* and the development of the *Texas Essential Knowledge and Skills*. The Texas Education Agency is made up of the commissioner of education and agency staff.

National Council of Teachers of Mathematics (NCTM). The term "National Council of Teachers of Mathematics" refers to a non-profit professional association dedicated to the improvement of mathematics education in elementary schools, middle schools, high schools, two-year colleges, and teacher education schools.

Eighth Grade Student. The term "Eighth Grade Student" refers to all eighth grade students enrolled in Texas public schools who met the qualifications to be administered the eighth grade *Texas Assessment of Knowledge and Skills* test.

Seventh Grade Student. The term "Seventh Grade Student" refers to all seventh grade students enrolled in Texas public schools who met the qualifications to be administered the seventh grade *Texas Assessment of Knowledge and Skills* test.

Sixth Grade Student. The term "Sixth Grade Student" refers to all sixth grade students enrolled in Texas public schools who met the qualifications to be administered the sixth grade *Texas Assessment of Knowledge and Skills* test.

Middle School Student. The term "Middle School Student" refers to all students enrolled in Texas public schools in either sixth, seventh, or eighth grade.

Summary

This chapter presented an introduction to the study of the strength and direction of the relationship between the reading achievement and the mathematics achievement of eighth grade students in a large urban school district in the south western United States as determined by the *Texas Assessment of Knowledge and Skills* tests. It discussed the following topics: (1) the need for the study; (2) statement of the problem; (3) the purpose of the study; (4) the research question and research hypothesis addressed in this study; and (5) the definition of terms used throughout this report. The next chapter, Chapter Two, will present a review of literature that provides an overview of the history of high-stakes assessment in Texas and how it is related and important to this study.

Chapter II

Literature Review

Introduction

The purpose of the study is to determine the strength and direction of the relationship between the three different levels of reading achievement on the *Texas Assessment of Knowledge and Skills* and the mathematics achievement of middle school students in a large urban school district in southwestern United States as assessed by the *Texas Assessment of Knowledge and Skills*, a review of the related literature follows. First, the literature review will provide a historical background of high stakes testing at the National level followed high by a historical background of high stakes testing in the state of Texas. Second, a discussion on problem solving that will define problem solving and provide a historical perspective on problem solving in mathematics. Third, a discussion on reading comprehension that will encompass defining reading comprehension, reading comprehension as it pertains to mathematics, and the relationship between reading comprehension and mathematics achievement. And finally, a summary of the literature review will culminate the chapter.

Historical Background

A Brief History Of High Stakes Testing In The United States Of America.

The results of the state mandated exams have an impact on an array of circumstances from affecting the individual test takers to affecting entire communities and districts. Real estate agencies use these test results to assess property values while school districts and states depend on these results for federal funding. For the individual test takers, the results could mean being promoted to the next grade level or being retained as well as

being accepted to an advanced academic program. There are many significant implications riding on the results of these tests, which is why they have been dubbed "High Stakes Tests". How is it possible that the results of some test could have such a significant impact on so many things of high importance? To gain some insight on the answer to this question one must look as how this situation came to be. The following is a brief history of high stakes testing corroborated by the United Stated Department of Education, Diane Ravitch in *The Death and Life of the Great American School System: How Testing and Choice are Undermining Education*, and Audry L. Amerian and David Berlinear in *High Stakes Testing, Uncertainty and Student Learning*.

High stakes testing can be traced back to the Elementary and Secondary Education Act of 1965. The Elementary and Secondary Education Act of 1965 was generated in response to the United States loosing in the space race to Soviet Union, when it successfully launched Sputnik. The Sputnik event caused concerns about the quality of American schools, and in response to these concerns the Elementary and Secondary Education Act was born. The Elementary and Secondary Education Act was originally meant to improve the quality of American schools and address the needs of students from less advantage homes. The Elementary and Secondary Education act gave rise to minimum competency tests to ensure that students left school with at least the ability to read and do basic mathematics. This act also suggested that students, who did not pass the minimum competency test, could be denied a diploma. The Elementary and Secondary Education Act did provide some consequences for the students, but did not provide any consequences for the teachers or schools.

Over the next decade, national concerns about the quality and success of American school grew in response to several factors. One major reason for concern was that international data consistently showed that American schools were not as good as the schools in other nations. Another major reason for concern was that while the international economy was doing well, the American economy was performing rather poorly. In 1983, the concerns of the 1970s lead to the release of *A Nation at Risk* prepared by The National Commission on Excellence in Education.

A Nation at Risk was a report intended to inform the American public on the state of the American education and provide suggestions as to how to overcome the deficiencies in the American education system. The report made many recommendations and probably the most notable was that high school graduation requirements be strengthened. The Commission urged that high school students study four years of English, three years of mathematics, three years of science, three years of social studies and one half year of computer science. In addition, it suggested that all college bound students should study at least two years of foreign language (Ravitch, 2010). Although there are many suggestions in the report, probably the most notable effect of *A Nation at Risk* was that it ended the minimum competency tests and initiated the standards movement and gave rise to high stakes testing. Through out the administrations of the 1980s and the mid 1990s, the standards movement gained momentum and was on a path to realization. Then in 1994, Lynne V. Cheney criticized the history standards, stating that the history standards were politically biased. This came at the point when the nation was making the transition from the George H.W. Bush administration to the Clinton Administration and to avoid political controversy the Clinton administration abandoned

the standards since no provisions had been established for their continued revision. Instead the Clinton administration differed to the states, so that each state wrote it's own standards, wrote their own tests, and became accountable for the achievement. The Clinton administration managed to accomplish this through the passing of *Goals 2000: The Educate America Act*. Essentially, Goals 2000 was a federal program that funded states that were adhering to the standards based reform. Goals 2000 set the following goals to be met by the year 2000:

1. All children in America will start school ready to learn.
2. The high school graduation rate will increase to at least 90 percent.
3. All students will leave grades 4, 8, and 12 having demonstrated competency over challenging subject matter including English, mathematics, science, foreign languages, civics and government, economics, arts, history, and geography, and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our Nation's modern economy.
4. The Nations' teaching force will have access to programs for the continued improvement of their professional skills and the opportunity to acquire the knowledge and skills needed to instruct and prepare all American students for the next century.
5. United States students will be first in the world in mathematics and science achievement.

6. Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.
7. Every school in the United States will be free of drugs, violence, and the unauthorized presence of firearms and alcohol and will offer a disciplined environment conducive to learning.
8. Every school will promote partnerships that will increase parental involvement and participation in promoting the social, emotional, and academic growth of children.

By the year 2000, none of the goals were attained and the nation was in need of an educational reform with the leading ideas being that of accountability and choice and in comes the No Child Left Behind act.

The No Child Left Behind Act was signed in to law on January 2002 by President George W. Bush. The No Child Left Behind Act was a reauthorization of the Elementary and Secondary Education Act, originally authorized in 1965. At the core of the No Child Left Behind Act are a number of measures designed to drive broad gains in student achievement and to hold states and schools more accountable for student progress. They represented significant changes to the education landscape (U.S. Department of Education, 2001). The following is a brief synopsis of the measures, established in No Child Left Behind, according to the United States Department of Education:

> Annual Testing: By the 2005-06 school year, states were required to begin testing students in grades 3-8 annually in reading and mathematics. By 2007-08, they had

to tests students in science at least once in elementary, middle, and high school. The tests had to be aligned with state academic standards. A sample of 4th and 8th graders in each state also had to participate in the National Assessment of Educational Progress testing program in reading and math every other year to provide a point of comparison for state test results.

Academic Progress: States were required to bring all students up to the "proficient" level on state tests by the 2013-14 school year. Individual schools had to meet state "adequate yearly progress" targets toward this goal (based on a formula spelled out in the law) for both their student population, as a whole, and for certain demographic subgroups. If a school receiving federal Title I funding failed to meet the target two years in a row, it would be provided technical assistance and its students would be offered a choice of other public schools to attend. Students in schools that failed to make adequate progress three years in a row also were offered supplemental educational services, including private tutoring. For continued failures, a school would be subject to outside corrective measures, including possible governance changes.

Report Cards: Starting with the 2002-03 school year, states were required to furnish annual report cards showing a range of information, including student-achievement data broken down by subgroup and information on the performance of school districts. Districts must provide similar report cards showing school-by-school data.

Teacher Qualifications: By the end of the 2005-06 school year, every teacher in core content areas working in a public school had to be "highly qualified" in each

subject he or she taught. Under the law, "highly qualified" generally meant that a teacher was certified and demonstrably proficient in his or her subject matter. Beginning with the 2002-03 school year, all new teachers hired with federal Title I money had to be "highly qualified." By the end of the 2005-06 school year, all school paraprofessionals hired with Title I money must have completed at least two years of college, obtained an associate's degree or higher, or passed an evaluation to demonstrate knowledge and teaching ability.

Reading First: The act created a new competitive-grant program called Reading First, funded at $1.02 billion in 2004, to help states and districts set up "scientific, research-based" reading programs for children in grades K-3 (with priority given to high-poverty areas). A smaller early-reading program sought to help states better prepare 3- to 5-year-olds in disadvantaged areas to read. The program's funding was later cut drastically by Congress amid budget talks.

Funding Changes: Through an alteration in the Title I funding formula, the No Child Left Behind Act was expected to better target resources to school districts with high concentrations of poor children. The law also included provisions intended to give states and districts greater flexibility in how they spent a portion of their federal allotments.

Most recently (September 2011) a flexibility plan, known as the Elementary and Secondary Education Act (ESEA) package has been approved in order to provide states with flexibility from the original mandates written in the No Child Left Behind Act. States can request flexibility from certain No Child Left Behind mandates only if they are transitioning students, teachers, and schools to a system aligned with college- and career-

ready standards for all students, developing differentiated accountability systems, and undertaking reforms to support effective classroom instruction and school leadership. The purpose of the ESEA Flexibility package, in the words of President Obama "To help states, districts and schools that are ready to move forward with education reform, our administration will provide flexibility from the law in exchange for a real commitment to undertake change. The purpose is not to give states and districts a reprieve from accountability, but rather to unleash energy to improve our schools at the local level" (Press Secretary, 2011).

A Brief History Of High Stakes Testing In The State Of Texas. The following is a summary of the history of high stakes testing in the state of Texas according to the Texas Education Agency:

The beginning of high stakes testing in the state of Texas started in 1979, with the introduction of the *Texas Assessment of Basic Skills* (TABS) test. The Texas legislature passed a bill requiring basic skills competencies in mathematics, reading, and writing for grades three, five, and nine. At this point in time there was no state-mandated curriculum and the learning objectives for the *Texas Assessment of Basic Skills* test had to be created by committees of Texas educators. By 1983 the Texas legislature began requiring retesting of students who failed the test and the results had to be reported to the state. Ninth grade students who failed the test had to retake the test again each year as long as they were enrolled in school. Students were only required to retake the test and not required to pass the test in order to receive a diploma.

The *Texas Assessment of Basic Skills* test was a multiple choice item test in which the students taking the test had to be able to read and understand the questions, written in English, in order to be able to answer the question. For mathematics, the *Texas Assessment of Basic Skills* posed many of the test items as arithmetic problems that were already set up and ready to solve. The *Texas Assessment of Basic Skills* did have some word problems but they were not the majority of the test items.

In 1984 the legislature changed the wording of the Texas Education Code from "basic skills" to "minimum skills competencies". The legislature was making changes with the intent of increasing the rigor of the state assessment and adding student sanctions for performance at the exit level. These changes led to the replacement of the *Texas Assessment of Basic Skills* (TABS) with the *Texas Educational Assessment of Minimum Skills* (TEAMS) test. The *Texas Educational Assessment of Minimum Skills* tested students in the first, third, fifth, seventh, ninth, and eleventh grade in the academic areas of mathematics, reading, and writing. In the school year of 1986-87, eleventh grade students were the first to be required to pass the *Texas Educational Assessment of Minimum Skills* in order to receive a diploma.

The *Texas Educational Assessment of Minimum Skills* was a multiple choice item assessment and required the student to be able to read and understand in order to answer the question, as did the *Texas Assessment of Basic Skills*. One of the main goals in developing the *Texas Educational Assessment of Minimum Skills* was to increase the rigor of the assessment, and in doing so the format of the assessment was adjusted. The *Texas Educational Assessment of Minimum Skills* did increase the rigor of the state assessment,

but was still a collection of a few word problems and ready to solve arithmetic word problems.

In 1990 the state law required the implementation of a new criterion-referenced assessment in place of the *Texas Educational Assessment of Minimum Skills*. This new assessment was the *Texas Assessment of Academic Skills* and it was focused on academic skills rather than on minimum skills. The *Texas Assessment of Academic Skills* was to be a more comprehensive assessment, as it was based on the *Essential Elements*, which at that time was the state-mandated curriculum. The *Texas Assessment of Academic Skills* was set to be administered to the students in the third, fifth, seventh, ninth, and eleventh grade, with the eleventh grade as the exit level. Eventually, the *Texas Assessment of Academic Skills* mathematics section was required by all grade levels, third through ninth and the tenth grade being the exit level. For mathematics, the *Texas Assessment of Academic Skills* presented the students with problems that were more rigorous than those on the *Texas Educational Assessment of Minimum Skills* and it also presented the majority of the problems in word problem format and a significantly less amount of set computation problems.

In 1999 the development of the *Texas Assessment of Knowledge and Skills* (TAKS) test was initiated in order to align the state assessment with the newly developed state mandated curriculum, the *Texas Essential Knowledge and Skills*. In conjunction with the development of the new state assessment, the Texas legislature passed bills to end social promotion and creating more rigorous testing programs (Texas Education Code, Chapter 39 and Chapter 28). Students in grades third, fifth, and eighth are now required to pass the reading and mathematics portions of the *Texas Assessment of*

Knowledge and Skills in order to move up to the next grade level. Students in the eleventh grade are required to pass the reading, mathematics, writing, science, and social studies portions of the *Texas Assessment of Knowledge and Skills* as graduation requirements. The *Texas Assessment of Knowledge and Skills* was developed to be a more rigorous assessment, and for mathematics this means that test questions are now more difficult than those of the *Texas Assessment of Academic Skills*. The *Texas Assessment of Knowledge and Skills* consists entirely of higher order thinking word problems in multiple-choice format and no set computation problems what so ever.

As of spring 2012, the State of *Texas Assessments of Academic Readiness* (STAAR) has replaced the *Texas Assessment of Knowledge and Skills* (TAKS). The STAAR program at grades three through eight assesses the same subjects and grades that were assessed on TAKS. At high school, however, grade-specific assessments have been replaced with 12 end-of-course (EOC) assessments: algebra I, geometry, algebra II, biology, chemistry, physics, English I, English II, English III, world geography, world history, and U.S. history. Overall, the STAAR program is increasing the level of rigor through out the entire assessment and this means that the complexity of the questions as well as the form in which the questions are presented have increased as well. For mathematics, this reinforces the problems solving word problem approach and rises, yet again, the level and complexity in which the test items are presented.

The transition of state assessment in the state of Texas has gone from the *Texas Assessment of Basic Skills* to the *State of Texas Assessments of Academic Readiness* in a period of about thirty years. As the state of Texas assessment changed from one to the other, the level of rigor of the questions has drastically increased, but the multiple choice

format remains the same through out. The last two assessment programs, *Texas Assessment of Knowledge and Skills* and the *State of Texas Assessments of Academic Readiness*, have brought problem solving to the forefront in assessment due to the fact that all of the assessment items in the Mathematics section are in word problem format with a high level of rigor. Now more than ever, students must be able to read and understand the problem in order to be successful on the state mandated mathematics assessment.

Problem Solving

In *Curriculum and Evaluation Standards for School Mathematics* (1989), the National Council of Teachers of Mathematics set the goal that students need to become mathematics problem solvers. Later, in *Principals and Standards for School Mathematics* (2000), the National Council of Teachers of Mathematics took it a step further elevated the significance of problem solving in the field of mathematics education by designating problem solving as one of the ten mathematics standards for the national curriculum of mathematics education. As one of the ten national Standards for the mathematics curriculum, problem solving has gradually made its way up to the forefront of mathematics education. In addition research has shown that successful problem solving is dependent on reading the problem for understanding (Franz & Hopper, 2007; Meyer & Hegarty, 1996; Schoenfeld, 1992). According to Baroody (1993) a problem can be posed in a written form (word problem), which indicates that students will have to read and understand the problem in order to answer the desired question. Franz and Hopper (2007) suggest that word problems can be especially difficult for two reasons, first the mathematics involved can be challenging and second the difficulty involved with

reading and understanding of the problem itself. It is possible that a student may get stuck in the comprehending piece and not be able to get to the mathematics piece of the problem. Students need to learn to read for understanding in order to become successful problem solvers in mathematics (Fuentes, 1998). It is reasonable to state that problem solving has emerged to a degree, such that it has had a substantial impact on how mathematics is taught as well as how it is assessed. In order to acknowledge the implications of problem solving, with respect to the purpose of this study, it is vital that the review of literature address problem solving to cast some light on the relationship between problem solving and reading comprehension as it pertains to the this study.

Defining Problem Solving. "Problem solving is a process. It is the method by which an individual uses previously acquired knowledge, skills, and understanding to satisfy the demands of an unfamiliar situation" (Krulik & Rudnick, 1989). Due to the fact that problem solving is a process, its definition may vary slightly from one source to another. According to Mayer and Wittrock (2006), problem solving is "cognitive processing directed at achieving a goal when no solution method is obvious to the problem solver". This definition consists of four parts. Part one deals with the idea that problem solving is cognitive, which means that problem solving occurs within the problem solver's cognitive system and can only be inferred from the problem solver's behavior. Part two states that problem solving is a process that involves applying cognitive processes to cognitive representations in the problem solver's cognitive system. Part three states that problem solving is directed, which indicates that problem solving is guided by the problem solver's goals. Part four states that problem solving is personal; problem solving depends on the knowledge and skill of the problem solver. In summary,

Mayer and Wittrock (2006) define problem solving as a cognitive processing directed at transforming a problem from the given state to the goal state when the problem solver is not immediately aware of a solution method. In *Problem Solving Strategies: Crossing the River with Dogs and Other Mathematical Adventures* (2001), Johnson and Herr define problem solving as what to do when you do not know what to do. This definition is presented within the context of a book where the focus is on problem solving strategies and their application to solve other similar or related problems. In *Principles and Standards for School Mathematics* (2000) the National Council of Teachers of Mathematics defines problem solving as engaging in a task for which the solution method is not known in advance. It is evident from these definitions and other definitions presented in the literature that at the core of the definition for problem solving is essentially the act of trying to resolve a situation for which the solution is not readily known. In light of the purpose of the study, the researcher will define problem solving as the National Council of Teachers of Mathematics defines problem solving, which is engaging in a task for which the solution method is not known in advance.

History of Problem Solving. Through out the literature George Polya has become know as the father of modern day problem solving (Long and DeTemple, 1996). In 1945 George Polya introduced the four-step problem-solving process in, the now classic, *How to Solve It*. The four steps in Polya's problem-solving process are as follows: Step1: Read the Problem, Step 2: Understand the problem, Step 3: Solve the problem, and Step 4: Look Back. Of the four steps in this problem-solving process, steps one and two are steps that naturally require the application of reading comprehension skills. According to Polya (1945) and Adams (2003), step one and step two are described

as follows. Step one of the problem solving process requires the problem solver to read the whole problem in its entirety. The problem solver should not focus on key words or questions without first reading the problem, because important information with regards to the situation in the word problem may be omitted or misinterpreted. Step two is described as the part of the problem solving process where the problem solver focuses on vocabulary, context of the problem, key words and question(s) of the problem, needed information, and identifying extraneous information if any. The completion of steps one and two is the part of the problem solving process where the problem solver truly understands the problem and the question(s) that need(s) to be answered. Polya's problem solving process brought new light to the teaching and learning of mathematics and with that new light came change to the field of mathematics education.

Ever since its' inception, Polya's problem-solving process has significantly influenced and changed the landscape of mathematics education as it pertains to problem solving, much so to the effect that The National Council of Teachers of Mathematics (NCTM) has identified Problem Solving as one of the ten Standards for the teaching and learning of mathematics. In *Principles and Standards for School Mathematics*, the National Council of Teachers of Mathematics describes these ten Standards as descriptions of what mathematics instruction should allow the students to learn and do at different stages as they move from prekindergarten to grade twelve. The ten Standards are divided into Content Standards and Process Standards. The six Content Standards are Number and Operations, Algebra, Geometry, Measurement, and Data Analysis and Probability. The four Process Standards are Problem Solving, Reasoning and Proof, Communication, Connections, and Representation. Together, the ten Standards are

identified as a comprehensive mathematics foundation, which is recommended for all students. With such a heightened focus on problem solving in mathematics and all that the problem solving process entails, it is evident that role of reading comprehension in the teaching and assessment mathematics will become more significant, since reading comprehension is an essential component of successful problem solving (Carter & Dean, 2006).

As the purpose of this study was to determine the strength and direction of the relationship between three levels of reading achievement and the mathematics achievement of middle school students in a large urban school district in southwestern United States as assessed by the *Texas Assessment of Knowledge and Skills*, the remaining part of the literature review will focus on reading comprehension aspect of Problem Solving, since the *Texas Assessment of Knowledge and Skills* presents all of the test items in written form, which are commonly know as word problems.

Reading Comprehension

Defining Reading Comprehension. Much like problem solving, reading comprehension is a process and its definition may vary depending on the source (Harst, Woodward, & Burke, 1984). The most common definition for reading comprehension is typically thought of as simply understanding text that is read (RAND, 2002; Kruinder, 2002). Moore, Moore, and Swafford (1991) compare and contrast reading comprehension as getting meaning from text verses reading comprehension as constructing meaning from text. The argument follows that getting meaning from text implies that the meaning is already defined in the text and it is just a matter of the reader identifying it. On the other hand constructing meaning from text suggests that the reader

actually constructs the meaning by interpreting and interacting with the text and applying prior or related knowledge. Hoover and Gough (1990) describe reading comprehension as a function of two mechanisms, word recognition and understanding of the language. In their explanation, Hoover and Gough indicate that in order for true reading comprehension to take place, both word recognition and understanding of the language must be met. Over the years the definition for reading comprehension has been refined to address the complexity and development of what it actually means to understand. It is imperative that reading comprehension is clearly defined; therefore, for the purpose of this study reading comprehension will be defined as follows: reading comprehension is the process of simultaneously extracting and constructing meaning through interaction and involvement with written language (RAND, 2002).

Reading Comprehension In Mathematics. Reading comprehension is a topic that can easily span across most, if not all, academic disciplines in one form or another. For the most part, educators in general tend to agree that reading is fundamentally important to the learning process (Adams & Lowry, 2007). In the field of mathematics reading involves multiple skills, which draw on the readers reading background as well as their mathematics background, to determine the course of action to take when solving a problem (Allington, 2001; Combs, 2002; van Oosterndrop & Goldman, 1998). Reading in the content area of mathematics poses special challenges because of the vocabulary and symbols that are specific to the field of mathematics (Barton, Heideman, & Jordan, 2002). Some of these challenges require special reading skills such as reading, comprehending, and decoding scores, symbols and graphics. Specifically within the area of mathematics, reading comprehension plays a significant role in that the learner is to

use reading comprehension ability and skills to determine the proper mathematics applications with respect to the situation (Ediger, 2003; Fuentes, 1998). Reading comprehension plays an important role in the teaching and learning of mathematics overall, but its impact is probably more evident in the problem solving area of mathematics, when students are engaging with and solving word problems (Ediger, 2002). When problems are posed in written form, the problem must be read and then solved according to the interpretation of the problem solver. Problem solving requires students to apply reading comprehension skills, such as reading for understanding and interpreting the situation to attain the necessary information to solve the problem (Adams, 2003; Fuentes, 1998; Shurter 2002). Ediger (2002) also states that reading an arithmetic word problem requires the reader to use reading comprehension skills to clearly understand what is required and needs to be done to solve the problem. It is evident that the level of reading comprehension skills that the reader possesses will have an effect on the outcome of the solution of the problem. If the reader can not correctly interpret the situation in the word problem, then the difficulty of solving the problem increases significantly due to the insufficient or inaccurate information attained by the problem solver. In short, to successfully solve arithmetic word problems, the problem solver should first read the word problem for understanding. Considering all of the reading comprehension skills required during the problem solving process for word problems, it is apparent that reading comprehension is a critical component of achieving success in mathematics with regards to problem solving (van Garderen, 2004). As previously mentioned in this chapter, the state mandated assessment is now almost entirely composed in the word problem format, and with the significance and

implications of these results, reading comprehension is a serious factor to be considered in the mathematical achievement of the students.

The Relationship Between Reading Comprehension And Mathematics Achievement

Previous research has shown that there is a strong relationship between reading comprehension and mathematics achievement. (Aiken, 1971; Carter & Dean, 2006; Helwig, Heath, & Tindal, 2000). Most of the current research that indicates this relationship has come to this conclusion only at a general level and has not addressed enough the details of reading comprehension and mathematics achievement (Fenwick, 2001; Love & Pimm, 1996; and Osterholm, 2005). Throughout the body of research relating reading comprehension and mathematics achievement, no one has identified or compared the relationship between different levels of reading achievement and the respective mathematics achievement with regards to the state mandated assessment, in particular the *Texas Assessment of Knowledge and Skills*. However, a study by John H. Lamb (2010) did address the effects of the reading difficulty of test items on the *Texas Assessment of Knowledge and Skills* and their performance mathematics assessments. The study looked questions that were written below the students reading, at the students reading level, and above the students reading level, and compared their success. The results of the study suggest that there is a negative relation ship between the reading difficulty of the test items and the mathematics success of the students. It is apparent that the relationship between reading comprehension and mathematics achievement is a complex relationship that involves many variables, but there are two basic major factors that affect the relationship, namely vocabulary and prior knowledge (Adams, 2003; Cloer, 1982).

Vocabulary

The Merriam-Webster Dictionary essentially defines vocabulary as a collection of words used in a language or particular field. When solving mathematics word problems, such as those on the *Texas Assessment of Knowledge and Skills*, the vocabulary effect is two fold because the problem solver must take into account the language in which the problem is written in and the language of mathematics (Carter & Dean, 2006; Fuentes, 1998). In order to understand the context and situation of the problem the reader must be able to understand the terminology articulated in the word problem as well as the symbols (Ediger, 1999). Vocabulary knowledge of both the written language and mathematics language is crucial under these circumstances so that the reader can correctly interpret the problem and eventually choose the proper mathematics to apply and solve the problem. Vocabulary knowledge itself is a basic necessity when reading for understanding, but when it comes to solving mathematics related world problems it becomes part of the problem solver's key background knowledge (Ediger, 1999; Franz &Hopper 2007).

Prior Knowledge

Ediger (2005; 1999) states that students need to possess background experiences in solving world problems. Background experiences are part of an individual's prior knowledge and in problem solving it may include prior knowledge related to mathematics, reading ability, and real world experiences. The success or achievement of an individual on a word problem based assessment, such as the *Texas Assessment of Knowledge and Skills*, is dependent on the individual's complete prior knowledge rather than just on their background knowledge strictly related to mathematics (Mayer & Hegerty, 1996; Shoenfeld, 1992). The understanding of the problem in context to the

related situation, the mathematical application and processes, and relevance of the mathematical outcome to correctly answered the posed question are all dependent on how the problem solver perceives and assesses the situation based on their overall prior knowledge (Lerkkanen, et al., 2005; Osterholm, 2002; Shoenfeld, 2002).

Conceptual Framework

This chapter included a review of the literature of the major areas related to the research questions in the proposed study. In summary, formal mathematics state assessments have fully become comprised of mathematical embedded text problems, which indicate that reading comprehension is now a major factor in mathematics achievement of state assessments. The literature supports that there is a relationship between reading comprehension and mathematics achievement and also firmly supports the analysis of the relationship to further advance the understanding of the relationship. The results can provide useful information in instructional practices that can lead to the improvement of reading and mathematics achievement. The results may also provide instructional material as well as specific prescriptions for improving the student as a mathematical problem solver.

In addition, the literature suggests that the mathematics achievement of students on state assessments may be highly related to the reading comprehension ability of the student. For example, to answer a question on a test, such as the TAKS, the student must first read the problem for understanding within the context of the problem situation, understand the question being posed, decide what mathematics procedures and applications will be necessary to correctly answer the question, before they can actually

do any of the mathematics. As Polya (suggested) in his layout of the problem solving process, understanding the problem is crucial to solving the problem correctly.

To understand the problem there are several factors (mathematical and reading) that may affect the understanding and successful solution to a word problem. The student needs to use reading comprehension skills in conjunction with their mathematics background and knowledge and skills to succeed at these types of problems. In addition vocabulary also plays an important role due to the premise of the situation involving an intertwined description including English language and mathematics language.

As history has shown, each time the state assessment in the state of Texas is revamped, the mathematics test items increase in rigor with respect to mathematics as well as in the format in which they are worded. The "wordier" the problems get the more seemingly challenging the problems become, because there is more information to decipher and to take into account in reference to the question at hand.

Conceptual Framework

Based on the above review of literature, the following framework will be used to guide to explore the relationship between reading achievement and mathematics achievement. A readers' schema, or organized knowledge of the world, provides much of the basis for comprehending, learning, and remembering the ideas in stories and text (Anderson, Osborn, & Tierney, 1984). In the field of mathematics reading involves multiple skills, which draw on the readers reading background as well as their mathematics background, to determine the course of action to take when solving a problem (Allington, 2001; Combs, 2002; van Oosterndrop & Goldman, 1998). Reading comprehension skill in conjunction with mathematics skills and abilities seem to be

related to the mathematics achievement of students on the state mandated high stakes test. This study hypothesized that there was a relationship between reading achievement and mathematics achievement and intends to explore the direction and strength of such a relationship.

Summary

In summary, the review of the related literature does indeed suggest that there is a relationship between reading achievement and mathematics achievement. As indicated, problem solvers must apply reading comprehension skills in order to successfully solve word problems in mathematics. In light of the purpose of the study, which is to determine the strength and direction of the relationship between three different levels of reading achievement and the mathematics achievement of eighth grade students in a large urban school district in the south western United States as assessed by the *Texas Assessment of Knowledge and Skills*, it is important to conduct a study that will shed some light upon this relationship which could be beneficial to mathematics classroom teachers, students, and building administrators.

The next chapter, Chapter Three, will describe the methodology used to test the research hypothesis in the study. The research design, participants, instrumentation, data collection procedures, data analysis procedures, and limitations will also be discussed in the following chapter.

Chapter III

Methodology

Introduction

The purpose of the proposed study is to determine the strength and direction of the relationship between the three different levels of reading achievement and the mathematics achievement of middle school students in a large urban school district in southwestern United States as assessed by the *Texas Assessment of Knowledge and Skills*. This chapter describes the methodology that will be used in conducting this methods study. A quantitative correlation research design was selected for this study because the researcher would like to determine the strength and direction of the relationship between the reading achievement and mathematics achievement of middle school students as measured by the *Texas Assessment of Knowledge and Skills*. This chapter is divided into the following subsections: (1) research design; (2) participants; (3) instrumentation; (4) data collection procedures; (5) data analysis procedures; (6) limitations of the study; and (7) summary.

Research Design

A bivariate correlational research design will be used to test the hypotheses of this study. This particular research design was chosen because the purpose of this study is to determine the strength and direction of the relationship between the three different levels of reading achievement and the mathematics achievement of middle school students in a large urban school district in southwestern United States as assessed by the *Texas Assessment of Knowledge and Skills*. The research paradigms that will be used in this study are as follows:

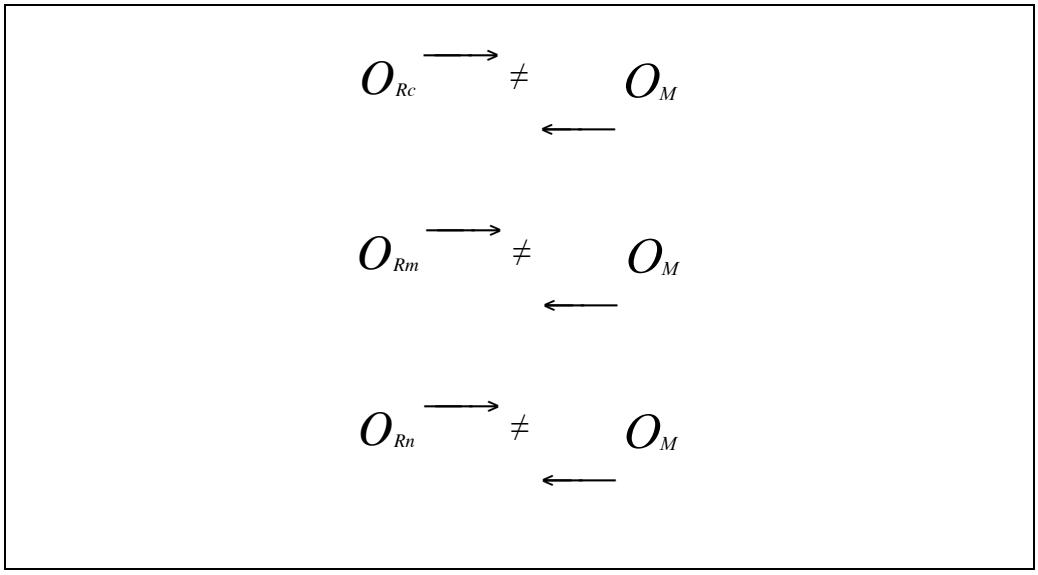

Figure 1. Research Paradigms. *Rc* = "Commended" Performance on Reading TAKS; *Rm* = "Met Standard" Performance on Reading TAKS; *Rn* = "Did Not Meet Standard" on Reading TAKS; *M* = Mathematics Achievement on TAKS.

In this study the variables were the reading achievement and mathematics achievement scaled scores resulting from the *Texas Assessment of Knowledge and Skills* administration during the participants middle school years. For each grade level (sixth, seventh, and eighth) the reading scale scores were separated into three groups, "Commended", "Met Standard", and "Did Not Meet Standard" and paired with their corresponding mathematics scale score. The data from each of these groups will be used to determine a correlation coefficient between the reading achievement level and the respective mathematics achievement of the middle school students who will participate in this study.

Participants

The participants in this study were be the current high school students in a large urban school district in southwestern United States who took the sixth, seventh, and eighth grade administration of the *Texas Assessment of Knowledge and Skills* during their

middle school years. The participants from this study were selected from an entire student population of a ninth grade campus in a large urban school district in the southwestern United States. From this population the participants were selected if they were administered both the reading and mathematics sections of the *Texas Assessment of Knowledge and Skills* in all three middle school grade levels; sixth, seventh, and eighth. Of the 981 students in the ninth grade school population, only 652 students met the qualifications to participate in the study (N = 652).

English Language Learners

Students who are learning the English language are classified as English Language Learners (ELL) in the public school system. A student who is classified as an English Language Learner is most likely adapting to a new learning environment, while learning new academic content in a language that is not their own (Lager, 2006). In a mathematics classroom, these students are not only learning mathematics, they are also learning the English version of the language of mathematics. As one may speculate and also supported by research, the English Language Learner performs significantly lower than the non-English Language Learner in achievement on academic assessments in subject areas such as reading, science, and mathematics (Abedi, 2002 & Lager, 2006). There are several variables that can be taken into account for the low academic achievement performance of the English Language Learner, but probably the most seemingly obvious one is the language deficiency of the student. Due to multi-variable facet involved with the mathematics achievement of English Language Learners, this particular group will be omitted from this study.

Instrumentation

In this study, the instrumentation that was used to collect the data was the *Texas Assessment of Knowledge and Skills*. The *Texas Assessment of Knowledge and Skills* is a criterion referenced multiple choice item test, which can consist of up to sixty items depending on the grade level. The *Texas Assessment of Knowledge and Skills* has been found reliable and valid for measuring the reading achievement and mathematics achievement of middle students in the state of Texas (Texas Education Agency, 2010). The Texas Education Agency reports that TAKS has internal consistencies in the high .80's and low .90's on the Kuder-Richardson Formula 20 (KR-20), to go along with a standard error of measure of 6.3. The test is carefully developed by numerous committees of Texas, which consist of educators, test development specialists, and staff members from the Texas Educational Agency.

Data Collection Procedures

The data for the study were collected from the archival files of a ninth grade school in a large urban school district in southwestern United States. A student's TAKS score is part of the student record, and therefore the data were readily available at the request of the researcher. The data collection procedures were as follows: after the *Texas Assessment of Knowledge and Skills* tests for reading were administered by the public schools, the answer sheets were sent to be scored by the Texas Education Agency Student Assessment Division. The raw scores were converted into scaled scores to equalize the test scores for all students at their respective grade level depending on the difficulty of the tests the students took. Once completed, the test scores are reported to the school, and the school makes a student file as part of the students' record.

Data Analysis Procedures

The data for this study were obtained from a ninth grade school in a large urban school district in southwestern United States. The data collected were all of the Reading and Mathematics TAKS scale scores for the entire population of the ninth grade school participating in the study. Only the sixth, seventh, and eighth grade scale scores were considered for this study, all other grade level scale scores were omitted from the original data set. From the sixth, seventh, and eighth grade scale scores, only those students who took the TAKS in all three grades were used in this study; all others were omitted from the remaining data set. A bivarate analysis using the Pearson product-moment correlation technique was used in this study to test the strength and direction of the correlations.

Limitations

The following limitations are factors beyond the researcher's control that may have affected the results of the study:

1. Student academic performance is affected by several variables such as socio-economic status, motivation, and family structure.
2. The conditions under which the tests were administered were out of the control of the researcher, which may have introduced some bias.
3. The researcher had no control in which order during the designated testing window the tests were administered. Test fatigue could be a contributing factor to the limitations of this study.
4. Student good faith and effort when completing the assessment could be a factor in the limitations of this study.

There was no sure way to insure the accuracy of the methods by which the tests were scored and how the correct number of responses was converted into a scale score.

Summary

The purpose of the study was to determine the strength and direction of the relationship between the three different levels of reading achievement and the mathematics achievement of middle school students in a large urban school district in southwestern United States as assessed by the *Texas Assessment of Knowledge and Skills*. This chapter described the methodology that was used to test the research hypotheses in this study. The research design, participants, instrumentation, data collection procedures, data analysis procedures, and limitations were also discussed. The next chapter, Chapter Four, will describe the results obtained when these procedures were applied.

Chapter IV

Results

Introduction

The purpose of the study was to determine the strength and direction of the relationship between the three different levels of reading achievement on the *Texas Assessment of Knowledge and Skills* and the mathematics achievement of middle school students in a large urban school district in southwestern United States as assessed by the *Texas Assessment of Knowledge and Skills*. In order to achieve this purpose the study tested 12 research hypotheses:

1. There is no statistically significant relationship between the sixth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
2. There is no statistically significant relationship between the sixth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
3. There is no statistically significant relationship between the sixth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
4. There is no statistically significant relationship between the seventh grade

students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

5. There is no statistically significant relationship between the seventh grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
6. There is no statistically significant relationship between the seventh grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
7. There is no statistically significant relationship between the eighth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
8. There is no statistically significant relationship between the eighth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.
9. There is no statistically significant relationship between the eighth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their

mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

10. There is no statistically significant relationship between thee reading achievement and mathematics achievement of sixth grade students as measured by the *Texas Assessment of Knowledge and Skills*.
11. There is no statistically significant relationship between the reading achievement and mathematics achievement of seventh grade students as measured by the *Texas Assessment of Knowledge and Skills*.
12. There is no statistically significant relationship between the reading achievement and mathematics achievement of eighth grade students as measured by the *Texas Assessment of Knowledge and Skills*?

The correlation procedures described in the previous chapter were used to gain answers to the research questions and test the research hypotheses. This chapter will describe the results obtained from the correlation procedures used to analyze the data. The results are reported in a narrative, tabular and graphic form.

Results Obtained

The following results were obtained in investigating research question one and testing research hypothesis one.

Research Question One. What is the strength and direction of the relationship between the sixth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypothesis One. There is no statistically significant relationship between the sixth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Figure 2, on the next page, displays the scatter plot obtained from the Pearson product moment correlation technique where the scores of sixth grade students who achieved a "Commended" performance on the Reading section of TAKS are compared against their respective mathematics score.

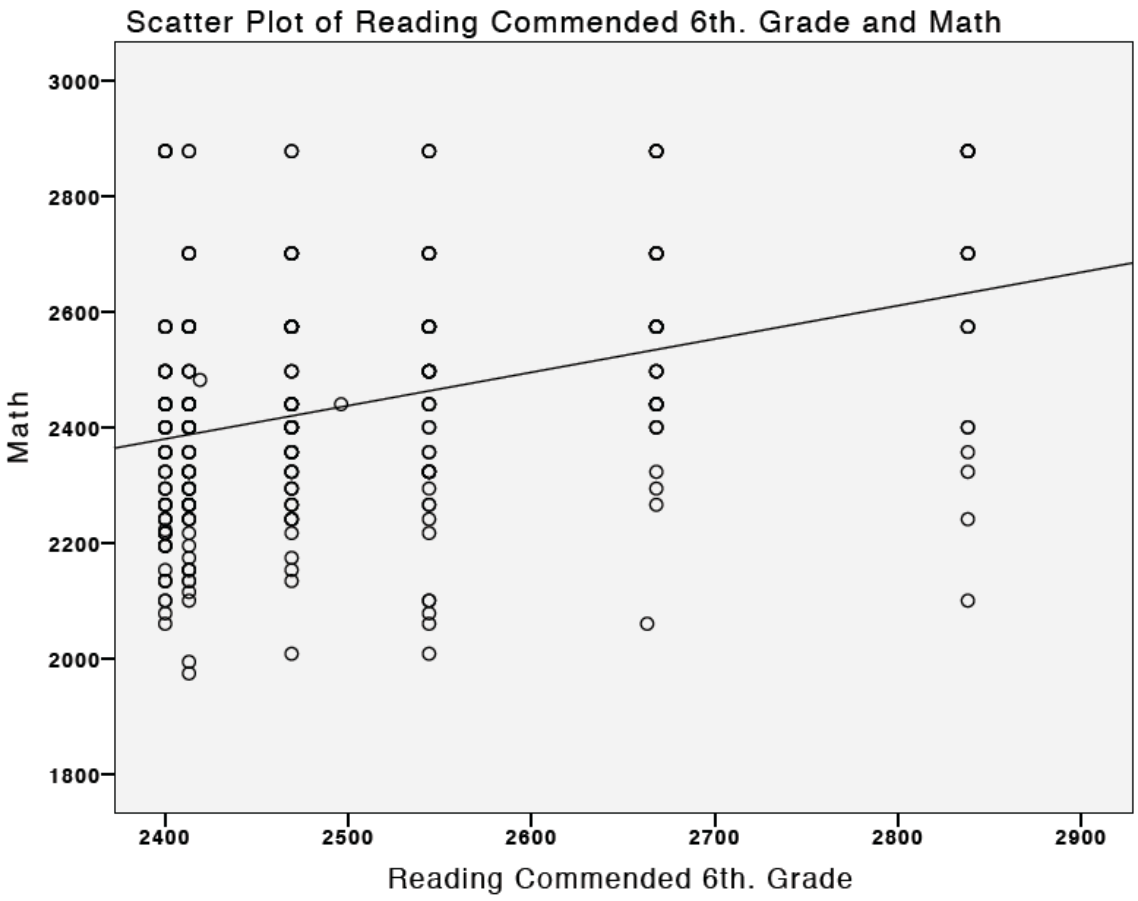

Figure 2. Scatter plot of the results obtained from the Pearson product-moment correlation of the relationship between the reading achievement and mathematics achievement of sixth grade students who achieved a "Commended" performance on the TAKS reading section.

The scatter plot suggests that the relationship between the sixth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills* is linear and positive. The following table presents the results obtained when the Pearson product-moment correlation technique was used to analyze the data.

Table 1

Result for Sixth Grade Reading Commended

Reading Score			Mathematics Score				
N	Mean	SD	N	Mean	SD	r	p
325	2495.20	121.013	325	2434.84	201.529	+.347	.000

As shown on Table 1, the Pearson product moment correlation technique yielded a correlation coefficient ($r = +.347$) that was statistically significant ($p < .01$).

The following results were obtained in investigating research question two and testing research hypothesis two.

Research Question Two. What is the strength and direction of the relationship between the sixth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypothesis Two. There is no statistically significant relationship between the sixth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Figure 3, on the next page, displays the scatter plot obtained from the Pearson product-moment correlation technique where the scores of sixth grade students who achieved a "Met Standard" performance on the Reading section of TAKS are compared against their respective mathematics score.

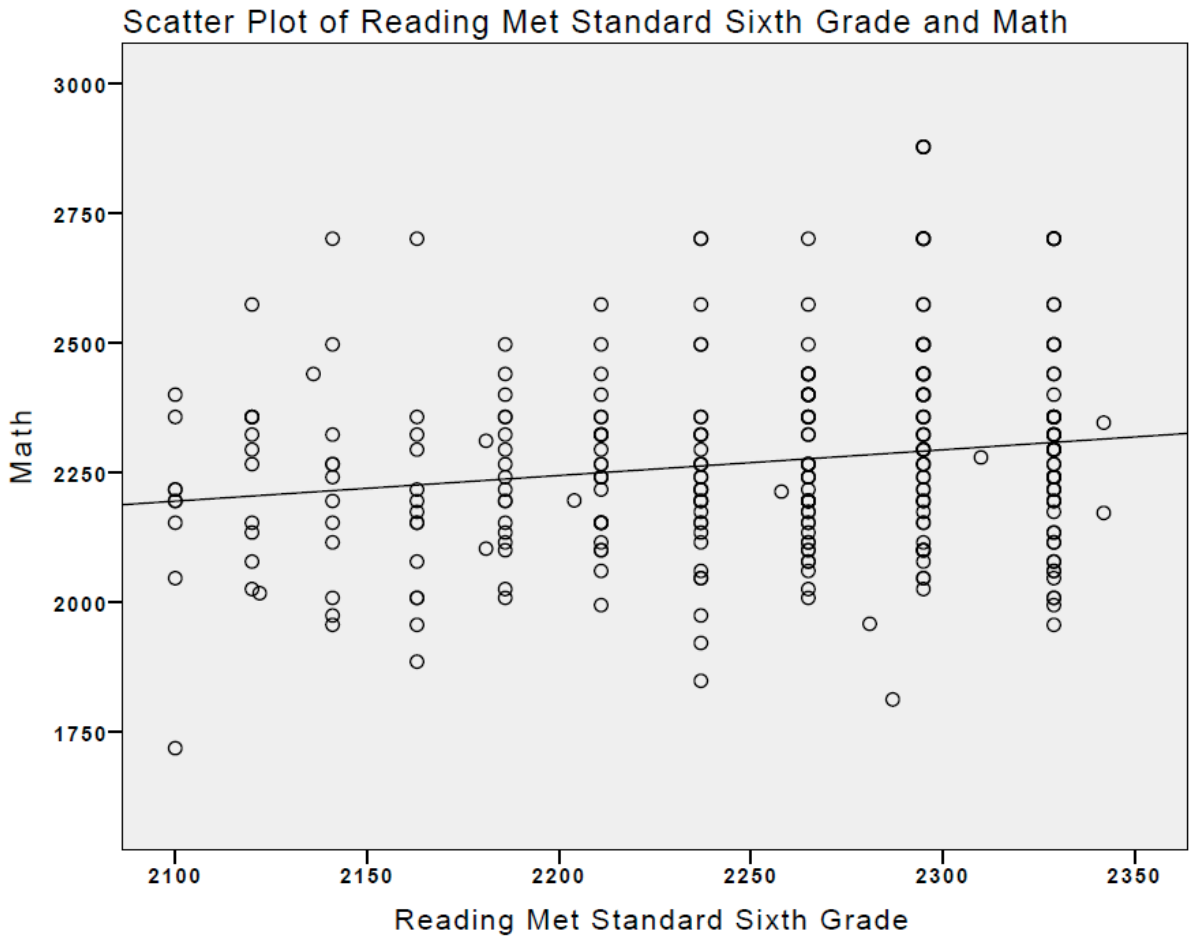

Figure 3. Scatter plot of the results obtained from the Pearson product-moment correlation of the relationship between the reading achievement and mathematics achievement of sixth grade students who achieved a "Met Standard" performance on the TAKS reading section.

The scatter plot suggests that the relationship between the sixth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills* is linear and positive. The following table presents the results obtained when the Pearson product-moment correlation technique was used to analyze the data.

Table 2

Result for Sixth Grade Reading Met Standard

Reading Score			Mathematics Score				
N	Mean	SD	N	Mean	SD	r	p
291	2248.80	66.927	291	2268.29	186.747	+.178	.002

As shown on Table 2, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = +.178$) that was statistically significant ($p < .01$).

The following results were obtained in investigating research question three and testing research hypothesis three.

Research Question Three. What is the strength and direction of the relationship between the sixth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypothesis Three. There is no statistically significant relationship between the sixth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. *Figure 4*, on the next page, displays the scatter plot obtained from the Pearson product-moment correlation technique where the scores of sixth grade students who achieved a "Did Not Meet Standard" performance on the Reading section of TAKS are compared against their respective mathematics score.

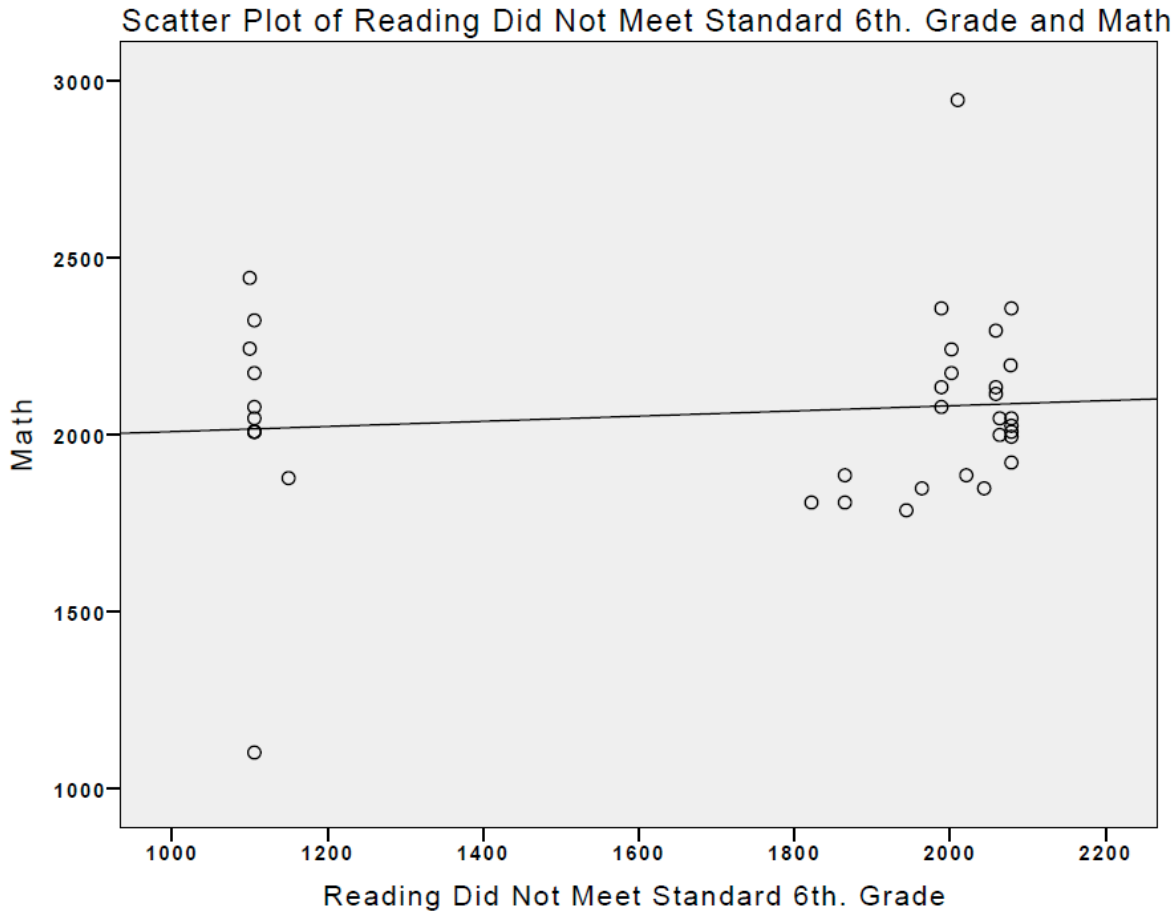

Figure 4. Scatter plot of the results obtained from the Pearson product-moment correlation of the relationship between the reading achievement and mathematics achievement of sixth grade students who achieved a "Did Not Meet Standard" performance on the TAKS reading section.

The scatter plot suggests that the relationship between the sixth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills* is linear and positive. The following table presents the results obtained when the Pearson product-moment correlation technique was used to analyze the data.

Table 3

Result for Sixth Grade Reading Did Not Meet Standard

Reading Score			Mathematics Score				
N	Mean	SD	N	Mean	SD	r	p
36	1737.81	427.588	36	2062.28	277.932	+.113	.514

As shown on Table 3, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = +.113$) that was not statistically significant ($p > .05$).

The following results were obtained in investigating research question four and testing research hypothesis four.

Research Question Four. What is the strength and direction of the relationship between the seventh grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypothesis Four. There is no statistically significant relationship between the seventh grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Figure 5, on the next page, displays the scatter plot obtained from the Pearson product-moment correlation technique where the scores of seventh grade students who achieved a "Commended" performance on the Reading section of TAKS are compared against their respective mathematics score.

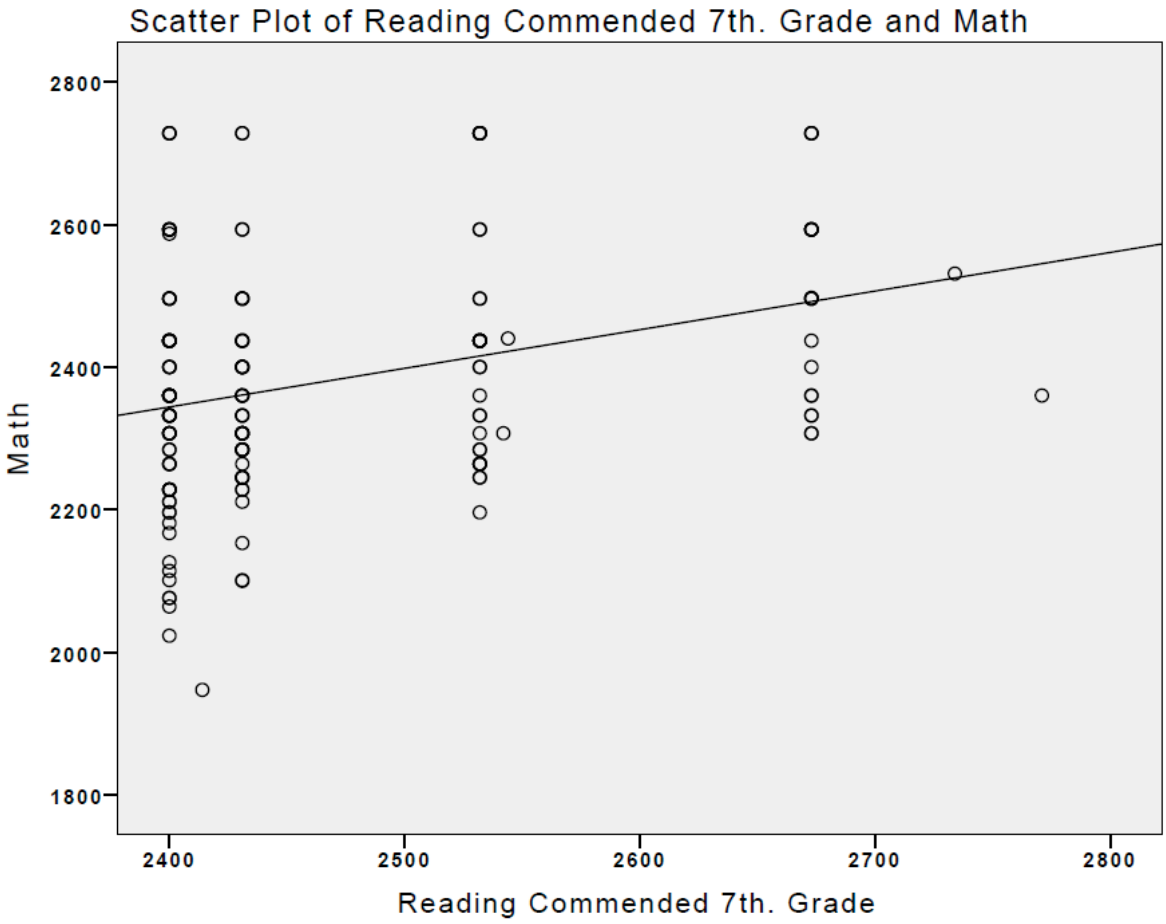

Figure 5. Scatter plot of the results obtained from the Pearson product-moment correlation of the relationship between the reading achievement and mathematics achievement of seventh grade students who achieved a "Commended" performance on the TAKS reading section.

The scatter plot suggests that the relationship between the seventh grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills* is linear and positive. The following table presents the results obtained when the Pearson product-moment correlation technique was used to analyze the data.

Table 4

Result for Seventh Reading Grade Commended

Reading Score			Mathematics Score				
N	Mean	SD	N	Mean	SD	r	p
168	2471.33	95.105	168	2382.58	162.425	+.317	.000

As shown on Table 4, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = +.317$) that was statistically significant ($p < .01$).

The following results were obtained in investigating research question five and testing research hypothesis five.

Research Question Five. What is the strength and direction of the relationship between the seventh grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypothesis Five. There is no statistically significant relationship between the seventh grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Figure 6, on the next page, displays the scatter plot obtained from the Pearson product-moment correlation technique where the scores of seventh grade students who achieved a "Met Standard" performance on the Reading section of TAKS are compared against their respective mathematics score.

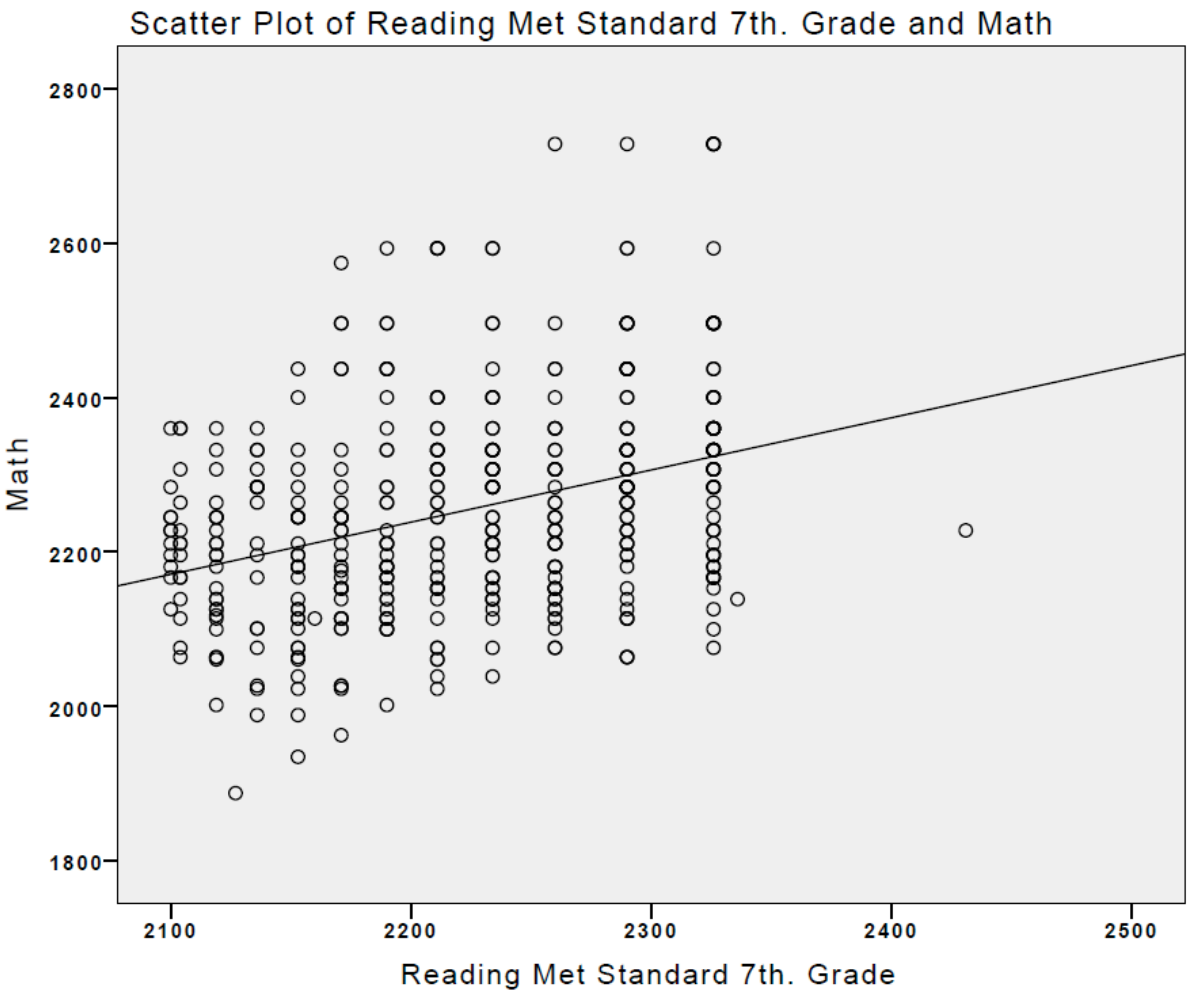

Figure 6. Scatter plot of the results obtained from the Pearson product-moment correlation of the relationship between the reading achievement and mathematics achievement of seventh grade students who achieved a "Met Standard" performance on the TAKS reading section.

The scatter plot suggests that the relationship between the seventh grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills* is linear and positive. The following table presents the results obtained when the Pearson product-moment correlation technique was used to analyze the data.

Table 5

Result for Seventh Reading Grade Met Standard

Reading Score			Mathematics Score				
N	Mean	SD	N	Mean	SD	r	p
291	2248.80	66.927	291	2268.29	186.747	+.178	.002

As shown on Table 5, the Pearson product moment correlation technique yielded a correlation coefficient ($r = +.178$) that was statistically significant ($p < .01$).

The following results were obtained in investigating research question six and testing research hypothesis six.

Research Question Six. What is the strength and direction of the relationship between the seventh grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypothesis Six. There is no statistically significant relationship between the seventh grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Figure 7, on the next page, displays the scatter plot obtained from the Pearson product-moment correlation technique where the scores of seventh grade students who achieved a "Did Not Meet Standard" performance on the Reading section of TAKS are compared against their respective mathematics score.

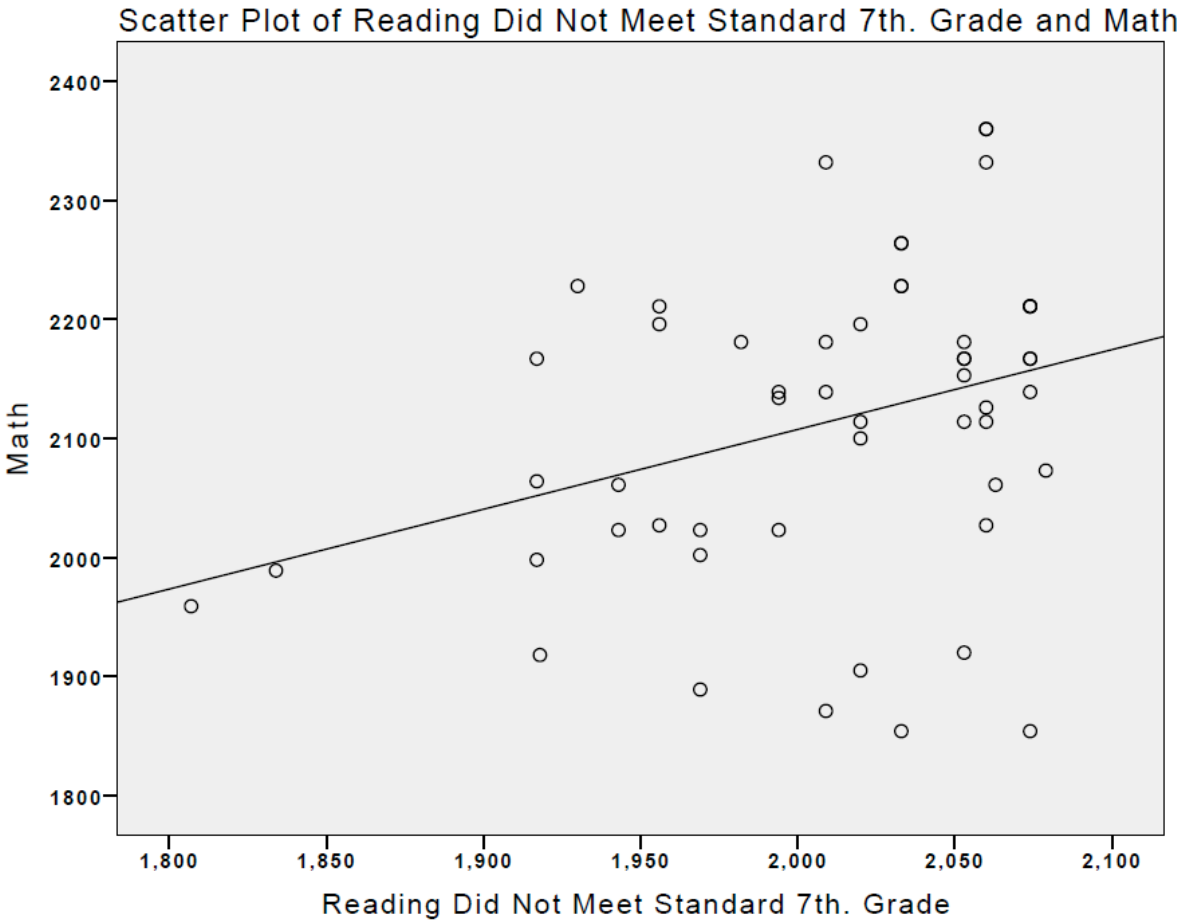

Figure 7. Scatter plot of the results obtained from the Pearson product-moment correlation of the relationship between the reading achievement and mathematics achievement of seventh grade students who achieved a "Did Not Meet Standard" performance on the TAKS reading section.

The scatter plot suggests that the relationship between the seventh grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills* is linear and positive. The following table presents the results obtained when the Pearson product-moment correlation technique was used to analyze the data.

Table 6

Result for Seventh Grade Reading Did Not Meet Standard

Reading Score			Mathematics Score				
N	Mean	SD	N	Mean	SD	r	p
53	2009.13	62.429	53	2113.64	128.813	+.325	.018

As shown on Table 6, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = +.325$) that was statistically significant ($p < .05$).

The following results were obtained in investigating research question seven and testing research hypothesis seven.

Research Question Seven. What is the strength and direction of the relationship between the eighth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypothesis Seven. There is no statistically significant relationship between the eighth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Figure 8, on the next page, displays the scatter plot obtained from the Pearson product-moment correlation technique where the scores of eighth grade students who achieved a "Commended" performance on the Reading section of TAKS are compared against their respective mathematics score.

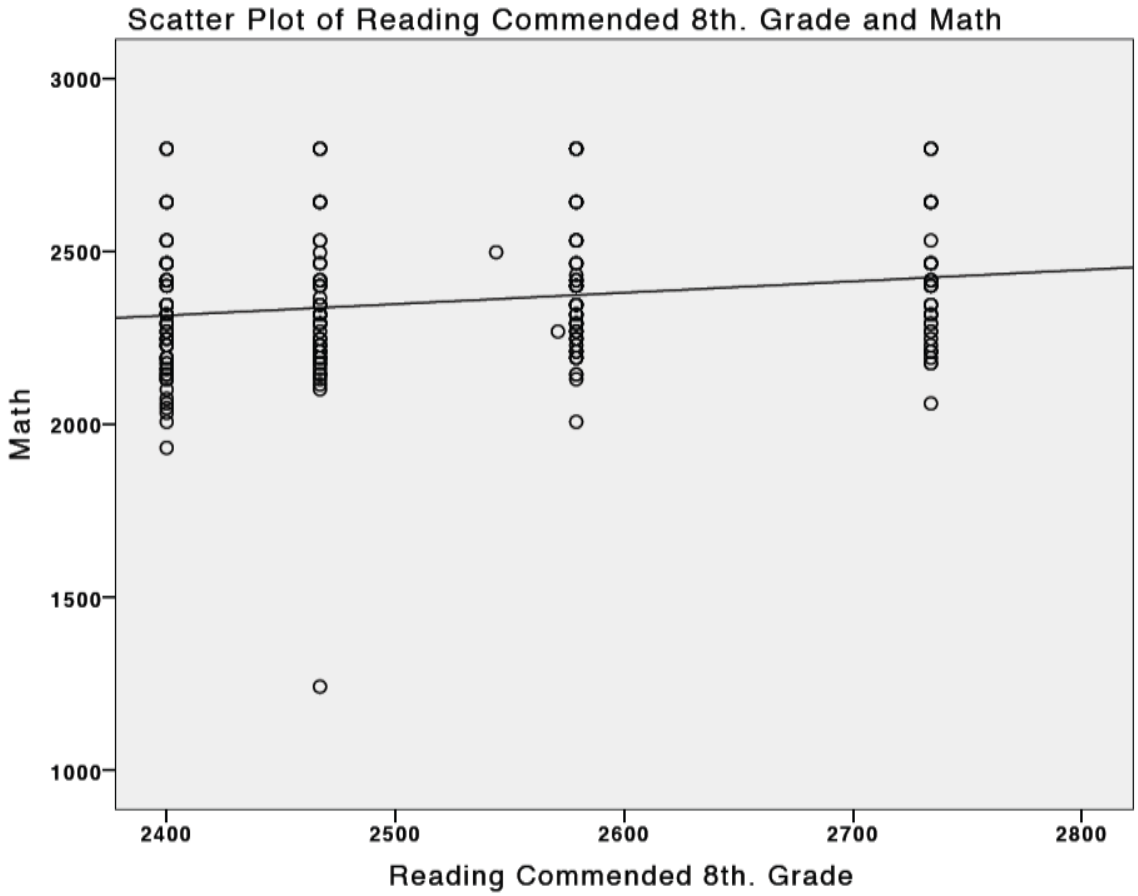

Figure 8. Scatter plot of the results obtained from the Pearson product-moment correlation of the relationship between the reading achievement and mathematics achievement of eighth grade students who achieved a "Commended" performance on the TAKS reading section.

The scatter plot suggests that the relationship between the eighth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills* is linear and positive. The following table presents the results obtained when the Pearson product-moment correlation technique was used to analyze the data.

Table 7.

Results for Eighth Reading Commended

Reading Score			Mathematics Score				
N	Mean	SD	N	Mean	SD	r	p
296	2520.80	116.714	296	2354.11	189.198	+.202	.000

As shown on Table 7, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = +.202$) that was statistically significant ($p < .01$).

The following results were obtained in investigating research question eight and testing research hypothesis eight.

Research Question Eight. What is the strength and direction of the relationship between the eighth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypothesis Eight. There is no statistically significant relationship between the eighth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Figure 9, on the next page, displays the scatter plot obtained from the Pearson product-moment correlation technique where the scores of eighth grade students who achieved a "Met Standard" performance on the Reading section of TAKS are compared against their respective mathematics score.

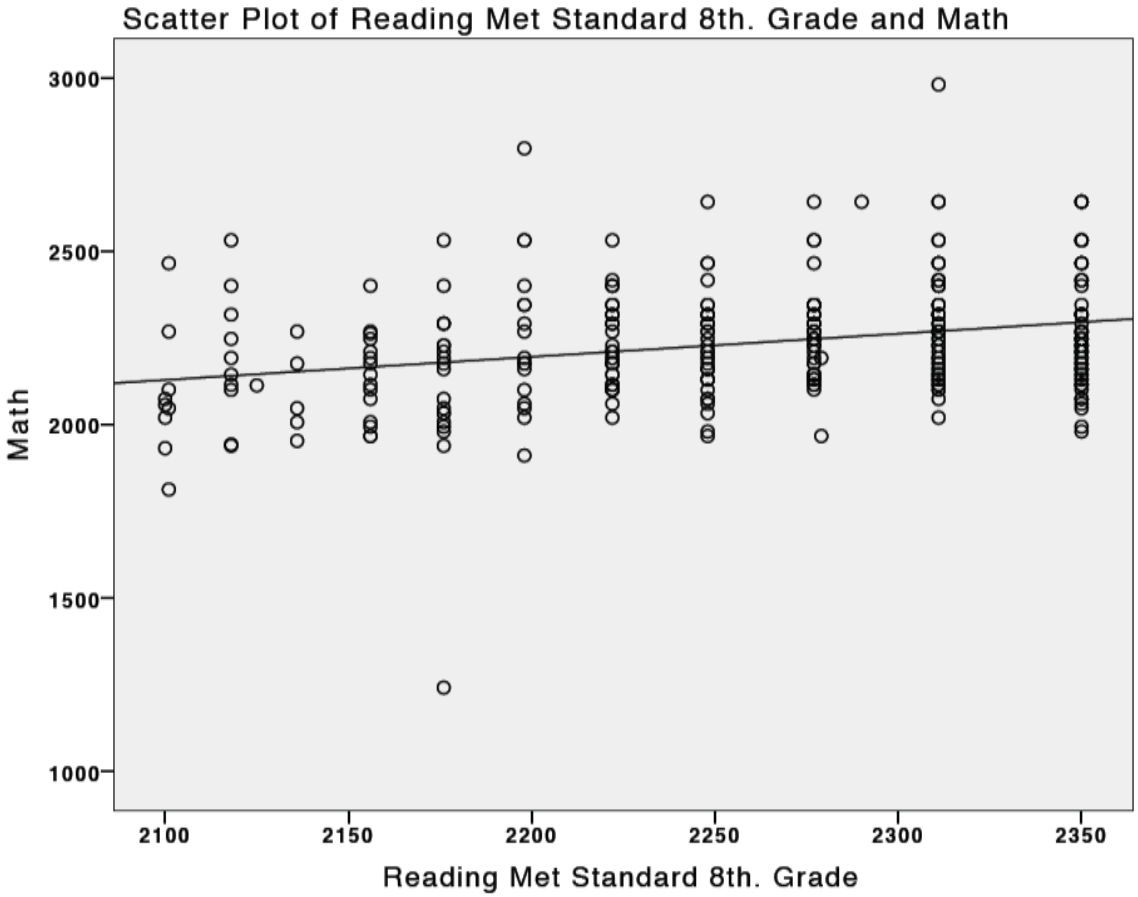

Figure 9. Scatter plot of the results obtained from the Pearson product-moment correlation of the relationship between the reading achievement and mathematics achievement of eighth grade students who achieved a "Met Standard" performance on the TAKS reading section.

The scatter plot suggests that the relationship between the eighth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills* is linear and positive. The following table presents the results obtained when the Pearson product-moment correlation technique was used to analyze the data.

Table 8.

Results for Eighth Grade Met Standard

Reading Score			Mathematics Score				
N	Mean	SD	N	Mean	SD	r	p
334	2261.87	71.725	334	2236.49	168.114	+.248	.000

As shown on Table 8, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = +.248$) that was statistically significant ($p < .01$).

The following results were obtained in investigating research question nine and testing research hypothesis nine.

Research Question Nine. What is the strength and direction of the relationship between the eighth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypothesis Nine. There is no statistically significant relationship between the eighth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. *Figure 10*, on the next page, displays the scatter plot obtained from the Pearson product-moment correlation technique where the scores of eighth grade students who achieved a "Did Not Meet Standard" performance on the Reading section of TAKS are compared against their respective mathematics score.

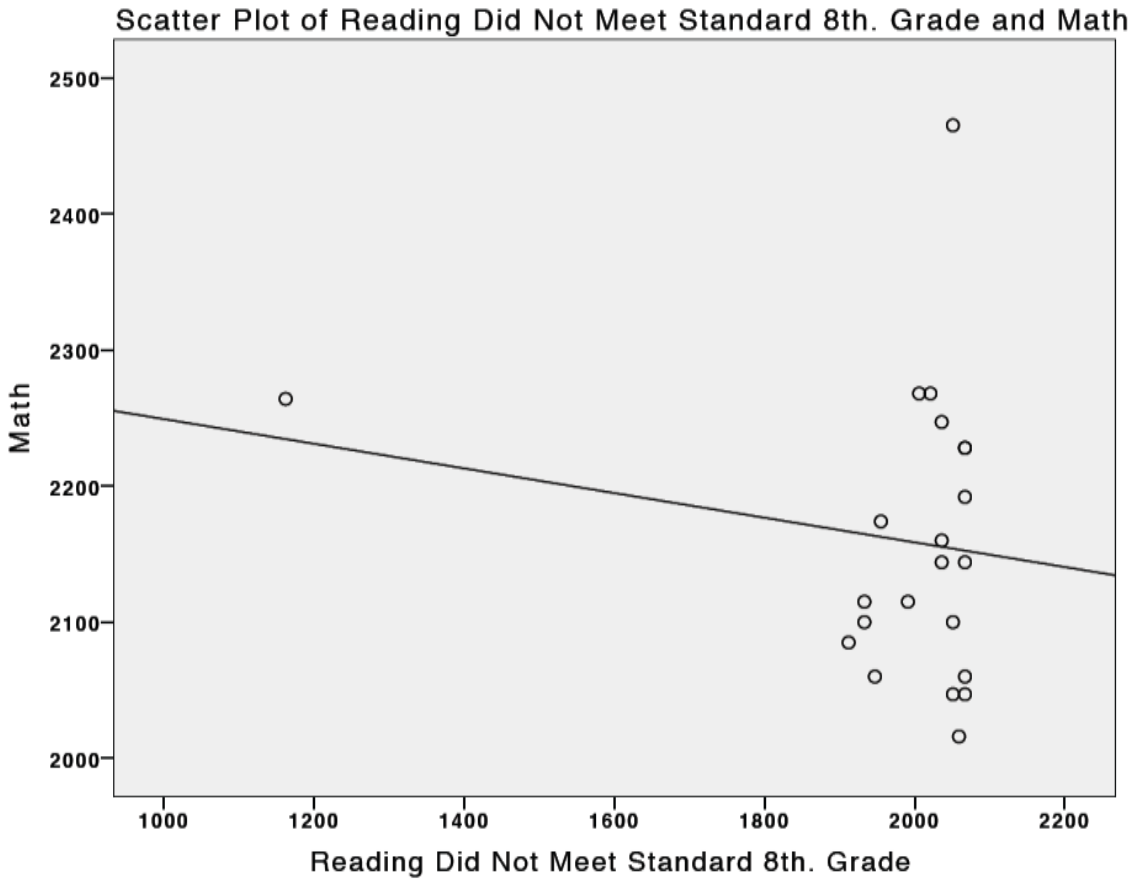

Figure 10. Scatter plot of the results obtained from the Pearson product-moment correlation of the relationship between the reading achievement and mathematics achievement of eighth grade students who achieved a "Did Not Meet Standard" performance on the TAKS reading section.

The scatter plot suggests that the relationship between the eighth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills* is linear and negative. The following table presents the results obtained when the Pearson product-moment correlation technique was used to analyze the data.

Table 9.

Results for Eighth Grade Did Not Meet Standard

Reading Score			Mathematics Score				
N	Mean	SD	N	Mean	SD	r	p
22	1981.00	190.053	22	2160.32	104.395	-.165	.463

As shown on Table 9, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = -.165$) that was not statistically significant ($p > .05$).

The following results were obtained in investigating research question ten and testing research hypothesis ten.

Research Question Ten. What is the strength and direction of the relationship between reading achievement and mathematics achievement of sixth grade students as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypothesis Ten. There is no statistically significant relationship between the reading achievement and mathematics achievement of sixth grade students as measured by the *Texas Assessment of Knowledge and Skills*.

Figure 11, on the next page, displays the scatter plot obtained from the Pearson product-moment correlation technique where the reading scores of sixth grade students on the Reading section of TAKS are compared against their respective mathematics score.

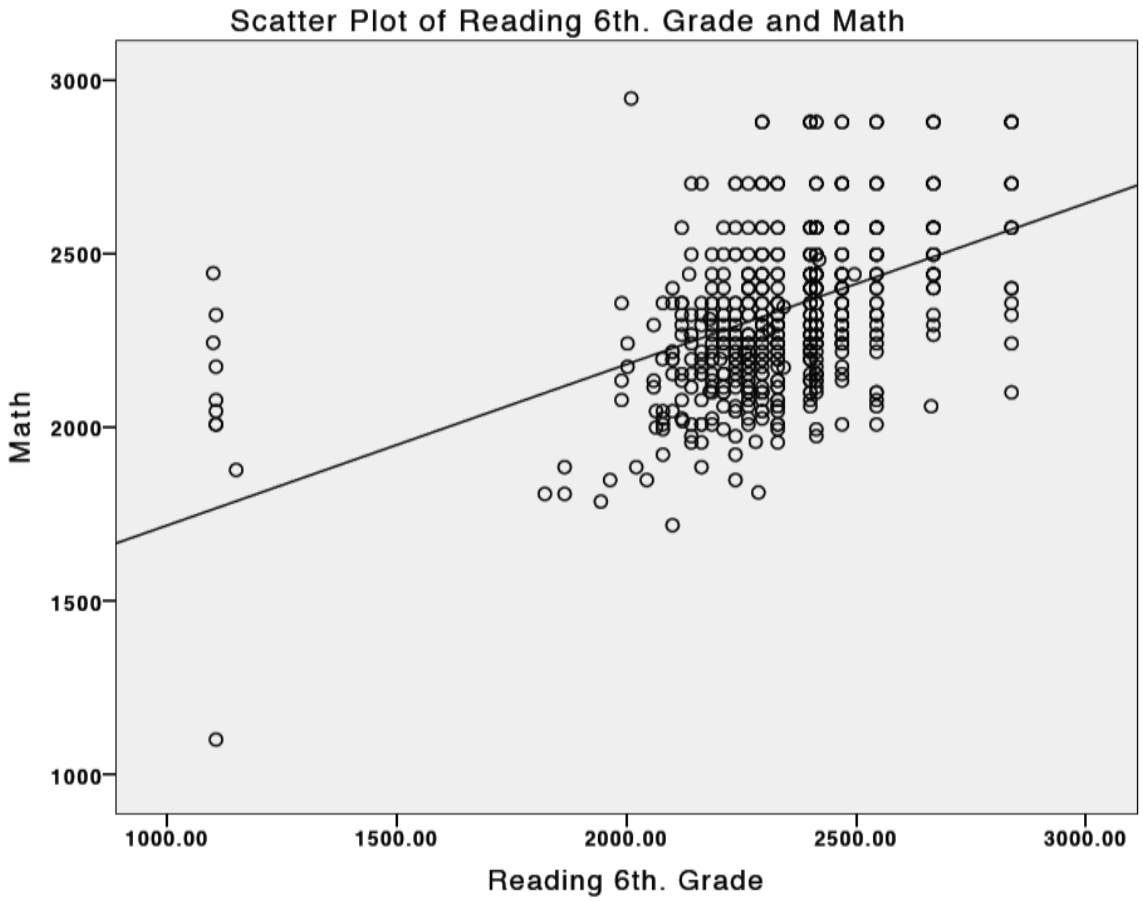

Figure 11. Scatter plot of the results obtained from the Pearson product-moment correlation of the relationship between the reading achievement and mathematics achievement of sixth grade students as measured by TAKS.

The scatter plot suggests that the relationship between the reading achievement and mathematics achievement of sixth grade students as measured by the *Texas Assessment of Knowledge and Skills* linear and positive. The following table presents the results obtained when the Pearson product-moment correlation technique was used to analyze the data.

Table 10.

Results for Sixth Grade Reading

Reading Score			Mathematics Score		
N	Mean	SD	N	Mean	SD
652	2343.408	234.305	652	2339.94	225.735

As shown on Table 10, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = +.481$) that was statistically significant ($p < .01$).

The following results were obtained in investigating research question eleven and testing research hypothesis eleven.

Research Question Eleven. What is the strength and direction of the relationship between reading achievement and mathematics achievement of seventh grade students as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypothesis Eleven. There is no statistically significant relationship between the reading achievement and mathematics achievement of seventh grade students as measured by the *Texas Assessment of Knowledge and Skills*.

Figure 12, on the next page, displays the scatter plot obtained from the Pearson product-moment correlation technique where the reading scores of seventh grade students on the Reading section of TAKS are compared against their respective mathematics score.

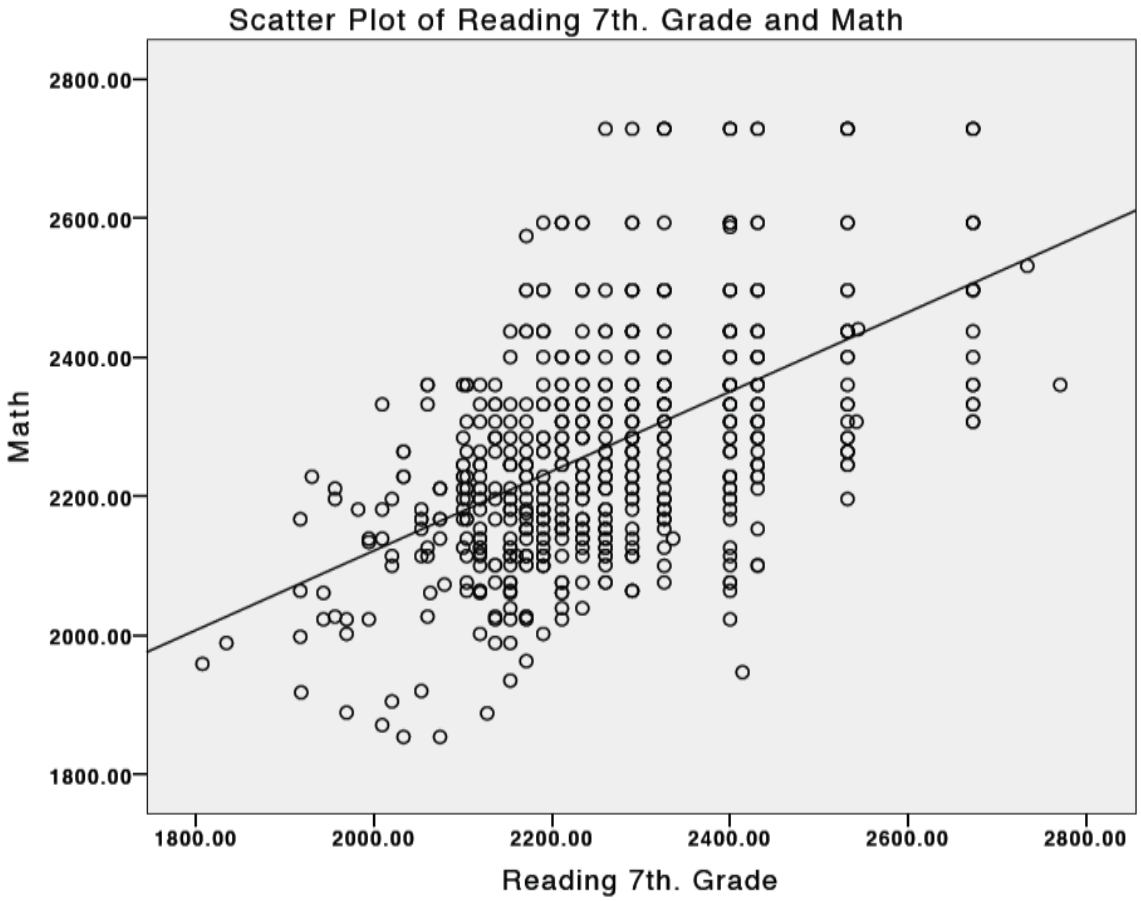

Figure 12. Scatter plot of the results obtained from the Pearson product-moment correlation of the relationship between the reading achievement and mathematics achievement of seventh grade students as measured by TAKS.

The scatter plot suggests that the relationship between the reading achievement and mathematics achievement of seventh grade students as measured by the *Texas Assessment of Knowledge and Skills* linear and positive. The following table presents the results obtained when the Pearson product-moment correlation technique was used to analyze the data.

Table 11.

Results for Seventh Grade Reading

Reading Score			Mathematics Score				
N	Mean	SD	N	Mean	SD	r	p
652	2269.820	152.874	652	2275.962	162.61	+.537	.000

As shown on Table 11, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = +.537$) that was statistically significant ($p < .01$).

The following results were obtained in investigating research question twelve and testing research hypothesis twelve.

Research Question Twelve. What is the strength and direction of the relationship between reading achievement and mathematics achievement of eighth grade students as measured by the *Texas Assessment of Knowledge and Skills*?

Research Hypothesis Twelve. There is no statistically significant relationship between the reading achievement and mathematics achievement of eighth grade students as measured by the *Texas Assessment of Knowledge and Skills*.

Figure 13, on the next page, displays the scatter plot obtained from the Pearson product-moment correlation technique where the reading scores of eighth grade students on the Reading section of TAKS are compared against their respective mathematics score.

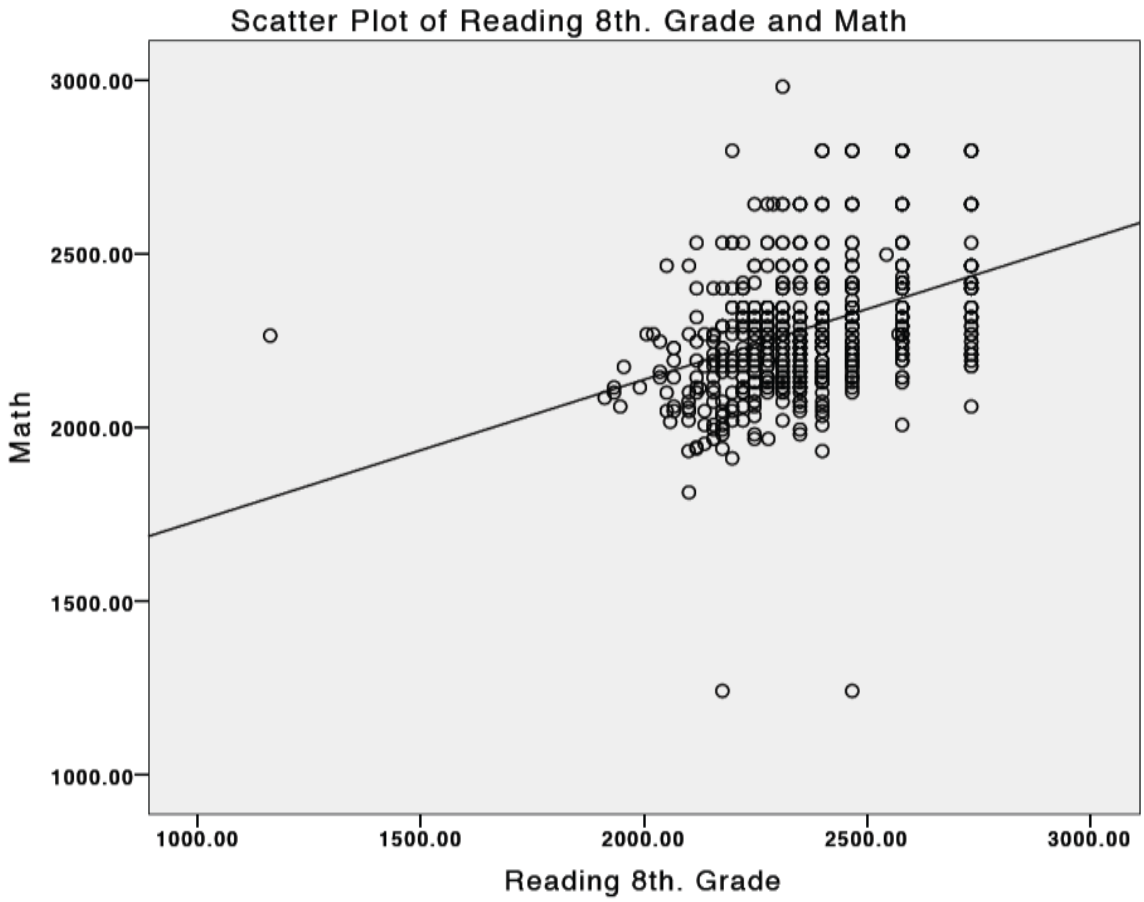

Figure 13. Scatter plot of the results obtained from the Pearson product-moment correlation of the relationship between the reading achievement and mathematics achievement of eighth grade students as measured by TAKS.

The scatter plot suggests that the relationship between the reading achievement and mathematics achievement of eighth grade students as measured by the *Texas Assessment of Knowledge and Skills* linear and positive. The following table presents the results obtained when the Pearson product-moment correlation technique was used to analyze the data.

Table 12.

Results for Eighth Grade Reading

Reading Score			Mathematics Score				
N	Mean	SD	N	Mean	SD	r	p
652	2369.945	177.262	652	2287.316	186.89	+.385	.000

As shown on Table 12, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = +.385$) that was statistically significant ($p < .01$).

Overall, in grades 6, 7, and 8 there was a statically significant relationship between reading achievement and mathematics achievement on TAKS. The following table presents the composite data of the overall results obtained from the Pearson product-moment correlation technique for middle school students.

Table 13

Results for Middle School Reading

Variable	N	Mean	SD	r	p
Reading 6	652	2343.408	234.305	+.481	.000
Math 6	652	2339.94	225.735		
Reading 7	652	2269.820	152.874	+.537	.000
Math 7	652	2275.962	162.61		
Reading 8	652	2369.945	177.262	+.385	.000
Math 8	652	2287.316	186.89		

As shown on Table 13, for grade 6, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = +.481$) that was statistically significant ($p < .01$). For grade 7, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = +.537$) that was statistically significant ($p < .01$). For grade 8, the Pearson product-moment correlation technique yielded a correlation coefficient ($r = +.385$) that was statistically significant ($p < .01$).

Summary

The purpose of the study was to determine the strength and direction of the relationship between the three different levels of reading achievement on the *Texas Assessment of Knowledge and Skills* and the mathematics achievement of middle school students in a large urban school district in southwestern United States as assessed by *the Texas Assessment of Knowledge and Skills*. Twelve non-directional hypotheses were tested using the Pearson product-moment correlation technique in an effort to address the purpose of this study. Scores from 652 middle school students who were administered both the Reading and Mathematics sections of the Texas Assessment of Knowledge and Skills during their sixth, seventh, and eighth grade year, were used to test hypotheses one through twelve. This chapter presented the results from the analyses used to test the hypotheses previously established in this study. The following chapter, Chapter Five, will present the conclusion, interpretations, and implications suggested by these results.

Chapter V

Disscussion And Implications

The purpose of the study was to determine the strength and direction of the relationship between the three different levels of reading achievement on the *Texas Assessment of Knowledge and Skills* and the mathematics achievement of middle school students in a large urban school district in southwestern United States as assessed by the *Texas Assessment of Knowledge and Skills*. In order to achieve the purpose of the study, 12 non-directional hypotheses were tested using the Pearson product-moment correlation technique. The previous chapter provided the results generated through the analysis of the data that were collected to test the hypotheses. This chapter provides a description of the conclusions, interpretations, and implications that derive from the results presented in the preceding chapter.

Conclusion and Interpretation of Research Hypothesis One

The first research hypothesis examined the relationship between the reading achievement of the sixth grade students who achieved a Commended performance on the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement. The first research hypothesis stated: There is no statistically significant relationship between the sixth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Table 1, (p. 51) presents the results obtained when the data were analyzed using the Pearson product-moment correlation technique for paired samples. In testing the statistical significance of the relationship between the sixth grade students who achieved

a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*, the Pearson product-moment correlation technique produced a correlation coefficient of $r = +.347$ with a probability value of $p < .001$, which was statistically significant. In educational research a correlation with a probability value of at least .05 must be present in order to consider the correlation for theoretical or practical value and used to estimate predictions based on the results (Fraenkel & Wallen, 2001). Based on these criteria, the reading achievement of sixth grade students who achieved a "Commended" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* is considered to have a strong positive relationship with their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. Therefore, the first non-directional hypothesis was accepted.

This suggest the following interpretation: There was a statistically significant relationship between the sixth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Conclusion and Interpretation of Research Hypothesis Two

The second research hypothesis examined the relationship between the reading achievement of the sixth grade students who achieved a "Met Standard" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement. The second research hypothesis stated: There is no statistically significant relationship between the sixth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of*

Knowledge and Skills and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Table 2, (p. 54) presents the results obtained when the data were analyzed using the Pearson product-moment correlation technique for paired samples. In testing the statistical significance of the relationship between the sixth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*, the Pearson product-moment correlation technique produced a correlation coefficient of $r = +.178$ with a probability value of $p < .05$, which was statistically significant. In educational research a correlation with a probability value of at least .05 must be present in order to consider the correlation for theoretical or practical value and used to estimate predictions based on the results (Fraenkel & Wallen, 2001). Based on these criteria, the reading achievement of sixth grade students who achieved a "Met Standard" on the Reading section of the *Texas Assessment of Knowledge and Skills* is considered to have a moderately strong positive relationship with their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. Therefore, the second non-directional hypothesis was accepted.

This suggest the following interpretation: There was a statistically significant relationship between the sixth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Conclusion and Interpretation of Research Hypothesis Three

The third research hypothesis examined the relationship between the reading achievement of the sixth grade students who achieved a "Did Not Meet Standard" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement. The third research hypothesis stated: There is no statistically significant relationship between the sixth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Table 3, (p. 57) presents the results obtained when the data were analyzed using the Pearson product-moment correlation technique for paired samples. In testing the statistical significance of the relationship between the sixth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*, the Pearson product-moment correlation technique produced a correlation coefficient of $r = +.113$ with a probability value of $p > .05$, which was not statistically significant. In educational research a correlation with a probability value of at least .05 must be present in order to consider the correlation for theoretical or practical value and used to estimate predictions based on the results (Fraenkel & Wallen, 2001). Based on these criteria, the reading achievement of sixth grade students who achieved a "Did Not Meet Standard" on the Reading section of the *Texas Assessment of Knowledge and Skills* is considered to have a moderately weak positive relationship with

their mathematics achievement as measured by the T*exas Assessment of Knowledge and Skills*. Therefore, the third research hypothesis was accepted.

This suggest the following interpretation: There was no statistically significant relationship between the sixth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. According to Polyas' problem solving model and previous research (Adams, 2003; Fuentes, 1998; Ediger 2002; Shurter 2002), the problems solver must be able to read the problem for understanding of the problem situation, question, and determine what mathematics to apply. It is likely that the relationship for this group of students was not statistically significant because the sixth grade students who achieved a "Did Not Meet Standard" in the Reading section of TAKS were "poor" readers to begin with and this may have hindered their mathematics achievement.

Conclusion and Interpretation of Research Hypothesis Four

The fourth research hypothesis examined the relationship between the reading achievement of the seventh grade students who achieved a "Commended" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement. The fourth research hypothesis stated: There is no statistically significant relationship between the seventh grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Table 4, (p. 60) presents the results obtained when the data were analyzed using the Pearson product-moment correlation technique for paired samples. In testing the statistical significance of the relationship between the seventh grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*, the Pearson product-moment correlation technique produced a correlation coefficient of $r = +.317$ with a probability value of $p < .001$, which was statistically significant. In educational research a correlation with a probability value of at least .05 must be present in order to consider the correlation for theoretical or practical value and used to estimate predictions based on the results (Fraenkel & Wallen, 2001). Based on these criteria, the reading achievement of seventh grade students who achieved a "Commended" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* is considered to have a strong positive relationship with their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. Therefore, the fourth non-directional hypothesis was accepted.

This suggest the following interpretation: There was a statistically significant relationship between the seventh grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Conclusion and Interpretation of Research Hypothesis Five

The fifth research hypothesis examined the relationship between the reading achievement of the seventh grade students who achieved a "Met Standard" performance

on the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement. The fifth research hypothesis stated: There is no statistically significant relationship between the seventh grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Table 5, (p. 63) presents the results obtained when the data were analyzed using the Pearson product-moment correlation technique for paired samples. In testing the statistical significance of the relationship between the seventh grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*, the Pearson product-moment correlation technique produced a correlation coefficient of $r = +.341$ with a probability value of $p < .001$, which was statistically significant. In educational research a correlation with a probability value of at least .05 must be present in order to consider the correlation for theoretical or practical value and used to estimate predictions based on the results (Fraenkel & Wallen, 2001). Based on these criteria, the reading achievement of seventh grade students who achieved a "Met Standard" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* is considered to have a strong positive relationship with their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. Therefore, the fifth non-directional hypothesis was accepted.

This suggest the following interpretation: There was a statistically significant relationship between the seventh grade students who achieved a "Met Standard"

performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Conclusion and Interpretation of Research Hypothesis Six

The sixth research hypothesis examined the relationship between the reading achievement of the seventh grade students who achieved a "Did Not Meet Standard" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement. The sixth research hypothesis stated: There is no statistically significant relationship between the seventh grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Table 6, (p. 66) presents the results obtained when the data were analyzed using the Pearson product-moment correlation technique for paired samples. In testing the statistical significance of the relationship between the seventh grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*, the Pearson product-moment correlation technique produced a correlation coefficient of $r = +.325$ with a probability value of $p < .05$, which was statistically significant. In educational research a correlation with a probability value of at least .05 must be present in order to consider the correlation for theoretical or practical value and used to estimate predictions based on the results (Fraenkel & Wallen, 2001). Based on these criteria, the reading achievement of seventh

grade students who achieved a "Did Not Meet Standard" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* is considered to have a moderately strong positive relationship with their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. Therefore, the sixth non-directional hypothesis was accepted.

This suggest the following interpretation: There was a statistically significant relationship between the seventh grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Conclusion and Interpretation of Research Hypothesis Seven

The seventh research hypothesis examined the relationship between the reading achievement of the eighth grade students who achieved a "Commended" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement. The seventh research hypothesis stated: There is no statistically significant relationship between the eighth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Table 7, (p. 69) presents the results obtained when the data were analyzed using the Pearson product-moment correlation technique for paired samples. In testing the statistical significance of the relationship between the eighth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of*

Knowledge and Skills and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*, the Pearson product-moment correlation technique produced a correlation coefficient of $r = +.202$ with a probability value of $p < .001$, which was statistically significant. In educational research a correlation with a probability value of at least .05 must be present in order to consider the correlation for theoretical or practical value and used to estimate predictions based on the results (Fraenkel & Wallen, 2001). Based on these criteria, the reading achievement of eighth grade students who achieved a "Commended" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* is considered to have a strong positive relationship with their mathematics achievement as measured by the Texas Assessment of Knowledge and Skills. Therefore, the seventh non-directional hypothesis was accepted.

This suggest the following interpretation: There was a statistically significant relationship between the eighth grade students who achieved a "Commended" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Conclusion and Interpretation of Research Hypothesis Eight

The eighth research hypothesis examined the relationship between the reading achievement of the eighth grade students who achieved a "Met Standard" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement. The eighth research hypothesis stated: There is no statistically significant relationship between the eighth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and*

Skills and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Table 8, (p. 72) presents the results obtained when the data were analyzed using the Pearson product-moment correlation technique for paired samples. In testing the statistical significance of the relationship between the eighth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*, the Pearson product-moment correlation technique produced a correlation coefficient of $r = +.284$ with a probability value of $p < .001$, which was statistically significant. In educational research a correlation with a probability value of at least .05 must be present in order to consider the correlation for theoretical or practical value and used to estimate predictions based on the results (Fraenkel & Wallen, 2001). Based on these criteria, the reading achievement of eighth grade students who achieved a "Met Standard" performance on the Reading section of the Texas Assessment of Knowledge and Skills is considered to have a strong positive relationship with their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. Therefore, the eighth non-directional hypothesis was accepted.

This suggest the following interpretation: There is a statistically significant relationship between the eighth grade students who achieved a "Met Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Conclusion and Interpretation of Research Hypothesis Nine

The ninth research hypothesis examined the relationship between the reading achievement of the eighth grade students who achieved a "Did Not Meet Standard" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement. The ninth research hypothesis stated: There is no statistically significant relationship between the eighth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Table 9, (p.75) presents the results obtained when the data were analyzed using the Pearson product-moment correlation technique for paired samples. In testing the statistical significance of the relationship between the eighth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*, the Pearson product-moment correlation technique produced a correlation coefficient of $r = -.165$ with a probability value of $p > .05$, which was not statistically significant. In educational research a correlation with a probability value of at least .05 must be present in order to consider the correlation for theoretical or practical value and used to estimate predictions based on the results (Fraenkel & Wallen, 2001). Based on these criteria, the reading achievement of eighth grade students who achieved a "Did Not Meet Standard" performance on the Reading section of the *Texas Assessment of Knowledge and Skills* is considered to have a weak negative relationship

with their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. Therefore, the ninth research hypothesis was accepted.

This suggest the following interpretation: There is no statistically significant relationship between the eighth grade students who achieved a "Did Not Meet Standard" performance in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. According to Polyas' problem solving model and previous research (Adams, 2003; Fuentes, 1998; Ediger 2002; Shurter 2002), the problems solver must be able to read the problem for understanding of the problem situation, question, and determine what mathematics to apply. It is likely that the relationship for this group of students was not statistically significant because the eighth grade students who achieved a "Did Not Meet Standard" in the Reading section of TAKS were "poor" readers to begin with and this may have hindered their mathematics achievement.

Conclusion and Interpretation of Research Hypothesis Ten

The tenth research hypothesis examined the relationship between the reading achievement of the sixth grade students on the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement. The tenth research hypothesis stated: There is no statistically significant relationship between the reading achievement and mathematics achievement of sixth grade students as measured by the *Texas Assessment of Knowledge and Skills*.

Table 10, (p. 78) presents the results obtained when the data were analyzed using the Pearson product-moment correlation technique for paired samples. In testing the statistical significance of the relationship between the reading achievement of sixth grade

students in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*, the Pearson product-moment correlation technique produced a correlation coefficient of $r = +.481$ with a probability value of $p < .001$, which was statistically significant. In educational research a correlation with a probability value of at least .05 must be present in order to consider the correlation for theoretical or practical value and used to estimate predictions based on the results (Fraenkel & Wallen, 2001). Based on these criteria, the reading achievement of sixth grade students on the Reading section of the *Texas Assessment of Knowledge and Skills* is considered to have a strong positive relationship with their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. Therefore, the tenth non-directional hypothesis was accepted.

This suggest the following interpretation: There was a statistically significant relationship between the reading achievement of sixth grade students in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Conclusion and Interpretation of Research Hypothesis Eleven

The eleventh research hypothesis examined the relationship between the reading achievement of the seventh grade students on the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement. The eleventh research hypothesis stated: There is no statistically significant relationship between the reading achievement and mathematics achievement of seventh grade students as measured by the *Texas Assessment of Knowledge and Skills*.

Table 11, (p.81) presents the results obtained when the data were analyzed using the Pearson product-moment correlation technique for paired samples. In testing the statistical significance of the relationship between the reading achievement of seventh grade students in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*, the Pearson product-moment correlation technique produced a correlation coefficient of $r = +.537$ with a probability value of $p < .001$, which was statistically significant. In educational research a correlation with a probability value of at least .05 must be present in order to consider the correlation for theoretical or practical value and used to estimate predictions based on the results (Fraenkel & Wallen, 2001). Based on these criteria, the reading achievement of seventh grade students on the Reading section of the *Texas Assessment of Knowledge and Skills* is considered to have a strong positive relationship with their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. Therefore, the eleventh non-directional hypothesis was accepted.

This suggest the following interpretation: There was a statistically significant relationship between the reading achievement of seventh grade students in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Conclusion and Interpretation of Research Hypothesis Twelve

The twelfth research hypothesis examined the relationship between the reading achievement of the eighth grade students on the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement. The twelfth research hypothesis stated: There is no statistically significant relationship between the reading

achievement and mathematics achievement of eighth grade students as measured by the *Texas Assessment of Knowledge and Skills*.

Table 12, (p. 84) presents the results obtained when the data were analyzed using the Pearson product-moment correlation technique for paired samples. In testing the statistical significance of the relationship between the reading achievement of eighth grade students in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*, the Pearson product-moment correlation technique produced a correlation coefficient of $r = +.385$ with a probability value of $p < .001$, which was statistically significant. In educational research a correlation with a probability value of at least .05 must be present in order to consider the correlation for theoretical or practical value and used to estimate predictions based on the results (Fraenkel & Wallen, 2001). Based on these criteria, the reading achievement of eighth grade students on the Reading section of the *Texas Assessment of Knowledge and Skills* is considered to have a strong positive relationship with their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*. Therefore, the twelfth non-directional hypothesis was accepted.

This suggest the following interpretation: There was a statistically significant relationship between the reading achievement of eighth grade students in the Reading section of the *Texas Assessment of Knowledge and Skills* and their mathematics achievement as measured by the *Texas Assessment of Knowledge and Skills*.

Implications

This study sought to extend the knowledge base of understanding the relationship between reading achievement and mathematics achievement of middle school students. The present study has a number of implications for educators in classroom and beyond.

First, the study provides further support of the significance of the relationship between reading achievement and mathematics achievement. Reading is important to the mathematics achievement in mathematics assessments, such as the TAKS, because students need to read and understand the test items and question, in order to correctly answer the question being asked (Franz & Hopper, 2007; Meyer & Hagerty, 1996; Schoenfeld, 1992). This implies the importance of teachers of mathematics to teach and model reading comprehension techniques and strategies in conjunction with their daily mathematics lessons. Doing so, could help students become better problem solvers and also help them become more successful in the state mathematics assessments.

Second, this study implies that mathematics teachers and reading teachers may benefit from collaborating and coordinating through lesson planning. Mathematics teachers may benefit by receiving advice and coaching in the implementation of reading comprehension techniques and strategies in to their daily mathematics lessons. The benefit for reading teachers would be that the reading comprehension techniques and strategies that they teach in the reading classroom would get reinforced in the mathematics classroom as well. This is a promising situation from the perspective of mathematics teachers, reading teachers, administrators, and students. Reading and mathematics teachers could see an improvement in the classroom and assessment performance of their students. Administrators could benefits from a possible boost in test

scores with respect to mathematics and reading achievement. Probably the most important beneficiaries would be the students themselves. Improving their reading comprehension skills implies that they are likely to improve both their reading and mathematics achievement on state testing, and in turn meeting promotion and graduation requirements.

A third and final implication from this study is that extra focus and attention is needed for students who are poor readers. This study showed that there is no significant relationship between the reading achievement and mathematics achievement of the students who failed the reading section of TAKS, while there is a significant relationship for those who passed. In Polyas' problem solving model, the problem solver must first be able to read and understand the problem and question before they can apply the mathematics to solve the problem. If a student cannot understand the problem or the question being posed, then the chances of answering the question correctly decreases significantly. This suggests that if students who are poor readers receive help and remediation, then they might stand a better chance at being more successful in both reading and mathematics assessments.

Recommendations for Further Research

This study sought to add significant knowledge to the research base as it pertains to the relationship between reading achievement and mathematics achievement. The results and implications from this study suggest that there are several other avenues for future research to continue to develop our understanding of the relationship between reading and mathematics achievement. First it is recommended that this study be replicated with the use of a different instrument, such as the new STAAR or the SAT 10.

The new STAAR test is the newest version of the state assessment in Texas. As history has shown, each time Texas has revamped the state assessment, the rigor and readability has increased. It is important that students are not hindered in their mathematics achievement due to issues related to reading and not mathematics. By replicating this study with a national assessment, such as the SAT 10, the results could broaden the generalizability beyond the scope of Texas.

As previously stated, the ELL students were omitted from this study because of the modifications that they may receive during the administration of the TAKS. ELL students are categorized by the level of English they test at; Beginner, Intermediate, and Advanced. Future research for ELL students should take into consideration the students ELL level and their reading and mathematics achievement.

This study was solely based on determining the correlation between the three different levels of reading achievement and the mathematics achievement of middle school students. It is recommended that a future study address the student thoughts and perceptions as they solve problems such as those on the TAKS. Such a study will help gain some insight as to how poor, average, and advanced readers approach and solve mathematical word problems.

The results of the study suggest that the mathematics achievement of those students who did not meet the standard in the reading section of TAKS, very little to no significant relationship with reading achievement. More research is needed to address the learning needs of such students. For this population, it is essential to identify all possible factors that could contribute reading achievement and gain an understanding of how these students apply their reading skills in solving mathematics word problems.

The readability of an item on a test could also be a contributing factor to mathematics achievement on state assessments. With the new assessment for Texas, STAAR, the rigor has increased and the form mathematics items are written have changed. It is recommended that a future study address the readability of mathematics test items and the success rate. If a test item is written at a grade level higher than the grade level of the student, the success rate is significantly diminished.

Summary

Chapter Five has discussed the conclusions, interpretations, and implications of the study. The present study confirms that, overall, there is a significant relationship between the reading achievement and mathematics achievement of middle school students. While reaffirming this relationship, the study brings to light the idea that this relationship does not apply to students who are poor readers. This study only considered reading achievement as a whole and perhaps more needs to be done to determine exactly what aspects of reading and reading comprehension are significant to mathematics achievement and other disciplines.

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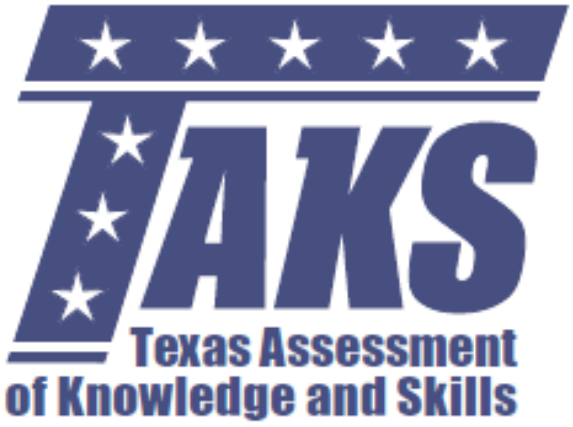
Appendix A

Instrumentation

STUDENT NAME _____



GRADE 6
READING

Read this selection. Then answer the questions that follow it.

Tangled Lines

My notes about what I am reading

1 The early-morning August sun was rising over the mountains across the lake. Alan sat next to his father in the small metal boat. He and his father had been to this fishing spot many times over the summer. Alan usually loved being here, but today his heart was heavy.

2 Alan's father leaned back and sighed comfortably. "I'm really glad we were able to have one last fishing weekend before you have to go back to school. It's a perfect day to relax," he said. His fishing line started to jerk. "And a perfect day to catch a big fish," he added. Alan's father reeled in a large catfish and scooped it up with the net. He held up the fish like a trophy.

3 "Dad expects everything to be the best," thought Alan. "I wonder what he'll say when I tell him I don't want to try out for the football team this year." Alan tried to push the thought out of his mind and concentrate on putting the worm on the hook.

4 "Here, Alan, let me show you a better way to get that bait on your hook," Dad said, reaching for Alan's fishing pole.

5 "I've got it, Dad," Alan answered, pulling away as he roughly put the worm onto the hook, nearly tearing it to pieces.

6 "O.K., but try to be a little more careful. You don't want it to fall apart," his father said, looking at the mangled bait. "Now, let me show you how to cast just right so you can catch the biggest fish."

7 "No, thanks," Alan mumbled.

8 "C'mon, you can do it! Just try," Dad said. "Watch how I do it." He demonstrated a perfect cast. Then he leaned back in the boat and pushed his hat down low over his forehead. "Now, you try."

My notes about what I am reading

9 *You can do it! Just try. Watch how I do it.* The words rang over and over in Alan's mind. It seemed to Alan that they were the only words his father had said all summer. Alan had told his father at the beginning of summer that he was thinking about trying out for his school's football team. Although Alan hadn't played much football before, he knew Dad would be pleased if he made the team. Dad always talked about how he had played football in high school and college. He was more than willing to help Alan learn the game.

10 The first day they practiced, Dad had thrown the ball to Alan. "You can catch it! Just try!" his father had called. Alan had run as fast as he could to catch the ball, but it hit his chest hard and bounced out of his hands. He stumbled and fell to the ground.

11 "Don't worry, Alan. You'll get it next time. Here, watch how I hold my hands to catch the ball," Dad had told him. All summer he and Dad had practiced football in the yard. Over and over again Alan would miss, and Dad would try to show him how to improve his skills. By the beginning of August, Alan had made some improvement, but he had also begun to loathe the game. He couldn't even stand the sight of a football.

12 Alan tried to bring his thoughts back to fishing. He raised his pole and threw the line out into the water, where it immediately became intertwined with his father's line. Alan tried to pull his line free from his father's, but the tangle only got worse.

13 "See, I can't! I don't want to! And I don't want to play football, either!" Alan blurted out. The words escaped before he knew it. Instantly he wished he could take them back.

14 "But I thought you liked football! You were getting really good at it," his father said.

15 "No, Dad, I just wanted to try it because you liked it. You were the one who was good at it, not me." Alan looked down at the water. "You always told me that I had to be the best. Well, I'm not the best."

16 His father shook his head sadly. "Son, I never said, 'Be the best.' Don't you remember? I always say, 'Do your best.' "

17 Alan sank farther down into his seat. The small boat rocked and then calmed. All around, everything was still and silent. Neither Alan nor Dad said a word in the uncomfortable silence.

18 It was probably only a few minutes, but it seemed like hours before either of them spoke. Finally Alan's father took out his pocketknife. "I guess we'll just have to cut these lines and start over," Dad said. With a quick tug of his knife, he cut the tangled lines and began pulling them in.

19 Alan reached into the tackle box and then fixed his line. He attached new bait to the hook, being more careful this time, and cast the line out as far as he could. Before long the bobber went under, and his line tightened.

20 "You've got a bite!" his father said, pointing. Alan jerked the pole to set the hook and began reeling in the line. But the line slackened, and the hook came up empty.

21 "It got away," Alan said, sighing.

22 "That's O.K.," Dad said as he cast his own line. "You can't expect to catch them all."

23 Alan glanced over at his father with a smile.

My notes about what I am reading

1 What happens at Alan's first football practice with his father?

A Alan listens to his father's football stories.

B Alan misses the ball and then falls.

C Alan asks his father to take him fishing.

D Alan starts to improve his catching skills.

2 What are paragraphs 9 through 11 mainly about?

F Why Alan wants to try out for football

G How Dad played football in school

H How Alan grows to dislike football

J Why Dad knows so much about football

3 The author probably wrote this story to —

A highlight the challenges of learning to play a sport

B show the importance of communicating

C describe a boy's day from beginning to end

D persuade fathers and sons to get along

4 Which sentence from the story shows Alan's true feelings about football?

F *All summer he and Dad had practiced football in the yard.*

G *Alan had told his father at the beginning of summer that he was thinking about trying out for his school's football team.*

H *It seemed to Alan that they were the only words his father had said all summer.*

J *He couldn't even stand the sight of a football.*

5 What does intertwined mean in paragraph 12?

A Caught before

B Moved forward

C Pulled against

D Joined together

6 Which of these best summarizes the story?

F On an early morning in August, Alan and his father go fishing. Alan's father catches a big catfish, but Alan has trouble putting the worm on his hook. Alan finally gets a bite on his line but loses the fish.

G Alan and his father go on their last fishing trip before school starts. Alan thinks about all the difficulties he has had practicing football with his father. When they tangle their fishing lines, Alan tells his father how he really feels.

H When Alan tells his father that he is thinking about trying out for the football team, his father helps him practice. While on a fishing trip, Alan argues with his father. They sit in silence for a long time.

J While on a fishing trip, Alan's father tries to show him how to make the perfect cast to catch the biggest fish. However, Alan cannot put the worm on his own hook. Alan becomes upset because he is thinking about how he feels about football.

7 Why does the author have Alan remember his first practice with his father?

A To show the reader how good Dad was at football

B To explain why Alan is angry about having to go fishing

C To demonstrate that Dad is an able coach

D To help the reader understand how discouraged Alan is with football

8 At the end of the story, the reader can conclude that Alan's father will —

F encourage Alan to try out for a different sport

G try harder to understand how Alan feels

H apologize to Alan for the things he has said

J help Alan improve his skills as a fisherman

9 Which sentence from the story shows that Alan's father is trying to be helpful?

A *"I'm really glad we were able to have one last fishing weekend before you have to go back to school."*

B *"But I thought you liked football!"*

C *Finally Alan's father took out his pocketknife.*

D *Over and over again Alan would miss, and Dad would try to show him how to improve his skills.*

10 How does Alan's attitude change by the end of this story?

F He believes that his father thinks he is improving at football.

G He realizes that his father just wants him to try to do his best.

H He understands why his father wants him to make the football team.

J He sees that he should be happy to be like his father.

Read this selection. Then answer the questions that follow it.

Good to the Bone

My notes about what I am reading

1 Have you ever seen a dog fetch a stick, "shake hands," or roll over on command? These tricks may be entertaining, but dogs are capable of much more. With their keen senses, sharp instincts, and loyalty to their owners and trainers, dogs are not just steadfast companions. For hundreds of years, humans and dogs around the world have worked together to save the lives of both people and animals.

2 The breed most closely associated with rescue work is the Saint Bernard. These large dogs are named after Bernard of Montjoux, a monk who pursued a life of religious study and service. Around the year 1050, Bernard of Montjoux built a rest house for people traveling through the Alps, a mountain range that runs through Switzerland. The rest house was built high in a mountain pass, about 8,000 feet above sea level.

Dogs of the Saint Bernard breed play in the Alps of Switzerland.

© Olivier Maire/epa/CORBIS

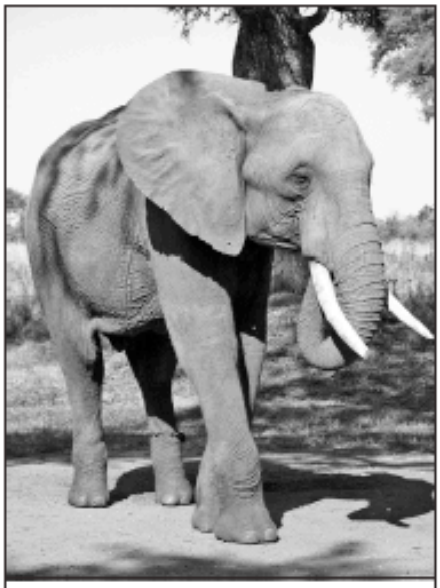
3 The route through the Alps held many dangers for travelers, including bandits and robbers. In addition, the mountain trails could be very steep, and in wintertime they were slippery and difficult to follow. Some people became lost in snowstorms and fog while trekking along these treacherous paths. Others were trapped by falling snow and rocks. The monks from the rest house rescued as many lost or injured travelers as they could.

4 It is believed that sometime between the sixteenth and eighteenth centuries, the monks started using dogs

My notes about what I am reading

to protect themselves from bandits. By 1750 the large dogs that eventually came to be known as Saint Bernards were also being used to aid travelers. These strong mountain dogs could clear paths through the snow and lead the monks on rescue missions. The dogs' excellent sense of direction was especially valuable in blinding snowstorms and fog. The dogs could also smell victims trapped as far as 20 feet beneath the snow. The monks and their dogs together saved the lives of more than 2,000 people over the years.

5 Dogs are still used to save people's lives, but more recently people have started using dogs to save the lives of endangered animals. In Kenya, Africa, the elephant population decreased from 170,000 in 1963 to less than 16,000 in 1989. This decline was largely the result of illegal hunting, or poaching. Elephant tusks are a major source of ivory. Because ivory is so valuable, people kill elephants and sell their tusks. Although many people in Kenya tried to stop them, some poachers were able to hide the evidence of their crimes. In 2001, the Kenyan government decided it was time to try something new. That's when they brought in Mouser, Charlie, Blair, Megan, Jason, and Vicky.



The KWS dog team helps protect the lives of elephants like this one.

© Blackplate #86 1820

6 These dogs were brought in from far away to join the fight against the poaching of elephants. Most of the dogs were former strays in London, England. They were chosen by the British army and trained at a special school for three months. The dogs learned to find ivory, rhino horn, and even weapons. Then the dogs and two British trainers made the trip to Naivasha, Kenya. The Kenya Wildlife Service (KWS) assigned 12

people to care for the dogs and take them out on ivory searches. One group of dogs was assigned to sniff for ivory and other illegal materials at airports and seaports. The dogs in the other group were trained to search Kenya's national parks for the poachers killing the elephants.

My notes about what I am reading

7 The dogs working in the parks used their natural hunting ability to lead police to poachers and those selling ivory. Because dogs rely on their sense of smell to locate their quarry, they can find people who have managed to hide their visible tracks. The Kenya Wildlife Service collected information about possible locations of illegal hunters. Then they took the dogs to the identified areas and ordered the dogs to "seek on." When the dogs caught the scent of ivory, they stood in that spot and barked.

8 People and dogs have lived together for centuries. The strong instincts of dogs have not only benefited humans but have also come to the aid of other animals as well, making the partnership between humans and dogs likely to continue for years to come.

11 According to the selection, the weather in the Swiss Alps was often so severe that people could not —

A visit the rest house

B find their way through the mountains

C hear the dogs barking at them

D call out to the monks for help

12 Why are dogs often able to locate poachers better than people can?

F Dogs are able to follow signs that are not visible.

G People are not able to endure lengthy searches.

H Dogs do not become fearful in dangerous situations.

J People are more often injured during ivory searches.

13 Which words from paragraph 3 best help the reader understand what treacherous means?

A *trekking along*

B *from the rest house*

C *in wintertime*

D *held many dangers*

14 How can the reader conclude that the problem of illegal poaching became more serious between 1963 and 1989?

F The Kenya Wildlife Service began training dogs to search for poachers.

G The elephant population decreased from 170,000 to less than 16,000.

H Many poachers learned how to conceal their crimes.

J The British army trained dogs at a special school.

15 Look at the following chart.

Tasks of St. Bernards in Switzerland	Tasks of Dogs in Kenya
Clearing snowy paths	Seeking out illegal ivory
	Signaling humans when ivory is found

Which information belongs in the empty space?

A Searching airports and seaports
B Attending special schools
C Navigating through snow and fog
D Discovering evidence of poachers

16 This selection is best described as —

F informative
G humorous
H persuasive
J expressive

17 The author organizes this selection by —

A relating the history of humans training dogs over thousands of years
B describing situations in which dogs and humans have achieved success together
C listing the breeds of dogs that are best known for assisting humans
D summarizing the stories of several rescue missions involving dogs

18 As used in paragraph 7, the word quarry means —

F the command of a trainer

G a wild animal

H the object of a search

J hidden food

19 Which sentence from the selection best supports the idea that people and dogs can do valuable work?

A *The monks and their dogs together saved the lives of more than 2,000 people over the years.*

B *When the dogs caught the scent of ivory, they stood in that spot and barked.*

C *These large dogs are named after Bernard of Montjoux, a monk who pursued a life of religious study and service.*

D *People and dogs have lived together for centuries.*

20 The reader can conclude that Saint Bernards made good rescue dogs mainly because they —

F had great strength and a strong sense of direction

G enjoyed searching for lost travelers

H knew how to avoid robbers and bandits

J knew the mountain paths better than the monks

Read the next two selections. Then answer the questions that follow them.

Terun's Climb

My notes about what I am reading

1 Terun awoke and listened carefully. The village was dark and silent except for the call of a few night birds. "It's time," he thought as he stood up and carefully stepped over his older brother Nipawe. Across the tent their father, a stern Apache warrior, stirred in his sleep. Terun waited. He didn't want anyone to know of his plan, although his father would no doubt be pleased—if Terun succeeded.

2 Terun stepped outside as the slender crescent moon peeked through the patchy clouds. He knew that morning was at least an hour away. "Should I wait?" he wondered, noting the scent of rain on the breeze. Terun looked around the sleeping village. "No," he decided. "I must go now."

3 Terun had noticed the eagle's nest two days earlier while hunting with his father and brother. Fearing that Nipawe would claim it, Terun had said nothing. Nipawe was nearly a man, strong and confident like their father. Nipawe often teased Terun, telling him that he was still a child. Terun longed to prove himself as a hunter and warrior, but his heart was troubled by a secret.

4 Terun shuddered as he recalled a hunting trip last season. While his father and Nipawe were scouting ahead for game, a mountain lion had suddenly pounced at Terun from behind a rock. Its menacing teeth and angry snarl had locked Terun in the grip of fear. His heart had been pounding, and he was unable to move. Then as quickly as it had appeared, the animal raised its head and darted into the thick brush. Thankfully the mountain lion left. Fearing that it would come back, Terun was fumbling with his bow when his father and brother returned. They had heard the mountain lion's roar.

5 "Did you hit him?" Terun's father had asked.

6 "No, Father," he answered, hanging his head.

7 "I am still proud," his father said, surprising Terun.

"You have found your courage." That night his father bragged that Terun had scared away a mountain lion. The men of the village grunted their approval.

8 "You're not fooling me," Nipawe growled later when he and Terun were alone. "How is it that you returned with all of your arrows?" Ashamed, Terun said nothing. His brother was right. He had not found his courage.

9 The sun was climbing the rim of the canyon when Terun arrived at the cliff. "There it is," he whispered, spotting the nest on a ledge. As a boy, the chief of Terun's tribe had taken a feather from an eagle's nest. People said that the chief possessed the great bird's courage. Terun wished for such courage. He too would snatch an eagle feather. Slowly but with great determination, he climbed to the nest.

10 Once he reached the nest, Terun knew he must hurry. If the eagle returned, it would attack, and Terun could fall to his death. He looked inside the nest and saw a single feather snagged in the twisted sticks. He grabbed it and quickly started down.

My notes about what I am reading

My notes about what I am reading

11 About halfway down the cliff, Terun reached an area where the rock was smooth. He searched frantically for a crack or ledge below him but could not find one. Although he held tightly to the crack above, he could feel his hands slipping. He looked down, and the air rushed from his lungs. He was paralyzed by fear. Then he remembered his father's words: "You have found your courage." Terun closed his eyes and breathed deeply. Feeling along the rock, he found a small indentation. Gripping it, he lowered himself and searched carefully for another place to put his hand.

12 That afternoon Terun strode through his village with the feather. Terun walked up to his father and presented the feather to him. Even Nipawe seemed to approve. Terun realized he had found his courage—not in the feather but in himself.

The Cry of the Wolf

My notes about what I am reading

1 Siniwai crouched behind a tree and watched the wolf pack. His breath came in short, hurried gasps, and his heart fluttered in his chest. He knew it was too late now. The wolves had seen him. If they attacked, he would try to outrun them. He closed his eyes briefly and tried to steady his body. He hoped the wolves would forget about him and begin their hunt. Then he would do what he had come to do. He remembered the wise old chief's words.

2 "Wolves know no fear," the chief had said. "They know only the hunt."

3 Siniwai had come to seek the chief's advice. Siniwai, a young Blackfoot warrior, had recently joined the tribe's hunting party. He was as skilled with the bow and arrow as any of the tribe's warriors, yet he had not been successful in his hunts. The sounds of the rushing river, the howling wind, and the rustling leaves of trees became the roars of mountain lions, the cries of wolves, and the growls of bears. Siniwai had worried so much that he couldn't concentrate on the hunt.

4 "To defeat your fears, you must become like a wolf. You must run with wolves and hunt with them," the chief had said.

5 "But they will hunt me," Siniwai had protested.

6 "Wolves do not hunt their own kind," the old man had said.

7 And so it was that Siniwai journeyed deep into the forest, not to hunt the wolves but to hunt with the wolves.

8 Siniwai spotted the pack leader, which was larger and more aggressive than the others. Then following an unseen and unheard command, the wolves began to move, swiftly but silently in a loping gait. They were running toward Siniwai! His legs weak and shaky

My notes about what I am reading

beneath him, Siniwai wondered whether the leader would attack him. The chief's words came back to him: "Wolves do not hunt their own kind."

9 Siniwai stood as tall as he could, trying to show no fear. The pack leader raced past him. The wolves did not attack. Siniwai turned and ran with them. He accidentally stepped on a brittle tree branch, and the snap seemed to echo throughout the forest. The leader turned his angry eyes on Siniwai and growled, chastising him for his carelessness.

10 Siniwai understood what he had done. He ran faster and closer to the pack. Siniwai knew that they had found the scent of their prey. The wolves ran faster, with mouths slightly open and teeth gleaming in the moonlight. He was among them now, close enough to see and feel the fire in their yellow eyes. Ahead a frightened animal desperately tried to escape. The lead wolf sounded the cry, and the pack joined in, barking and yelping. They were at full speed now, and Siniwai was one of them. His fear gone, he had become a wolf, singing the song of the hunter—the cry of the wolf!

Use "Terun's Climb" (pp. 15–17) to answer questions 21–24.

21 Terun is able to overcome his anxiety on the cliff because he —

- **A** has climbed the cliff once before
- **B** remembers what his father said to him
- **C** thinks of how surprised his brother will be
- **D** knows someone will help him down from the cliff

22 Nipawe knows that Terun —

- **F** plans to sneak out alone during the night
- **G** is braver than he is
- **H** did not shoot any of his arrows
- **J** was unable to find an eagle's nest

23 Paragraphs 4 through 8 are important to the story because they —

- **A** explain the reason Terun decides to get the eagle feather
- **B** create a feeling of anger between Terun and his brother
- **C** contrast the differences between Terun and his father
- **D** describe the similarities between the eagle feather and the mountain lion

24 Which sentence from the story shows that Terun has learned from his experience?

- **F** *That afternoon Terun strode through his village with the feather.*
- **G** *Terun realized he had found his courage—not in the feather but in himself.*
- **H** *That night his father bragged that Terun had scared away a mountain lion.*
- **J** *He didn't want anyone to know of his plan, although his father would no doubt be pleased—if Terun succeeded.*

Use "The Cry of the Wolf" (pp. 18–19) to answer questions 25–29.

25 Siniwai knows he must hunt with the wolves in order to —

- **A** speak with the chief
- **B** become a successful warrior
- **C** join the tribe's hunting party
- **D** learn how wolves attack their prey

26 What are paragraphs 9 and 10 mostly about?

- **F** Siniwai becoming a part of the wolf pack
- **G** What the lead wolf does to Siniwai
- **H** Siniwai trying not to show fear
- **J** Why Siniwai cries with the wolves

27 Siniwai angers the wolf leader when he —

- **A** challenges the wolf's right to lead the pack
- **B** makes noise that could alert the prey
- **C** is in the way as the pack begins to run
- **D** is in a part of the woods where only animals live

28 The reader can conclude that the wolves —

- **F** run past Siniwai out of fear
- **G** do not notice Siniwai hiding in the woods
- **H** accept Siniwai as a fellow hunter
- **J** do not want Siniwai along on the hunt

29 What does the word aggressive mean in paragraph 8?

- **A** Fierce
- **B** Quiet
- **C** Trusting
- **D** Anxious

Use "Terun's Climb" and "The Cry of the Wolf" to answer questions 30–32.

30 The resolutions in both of these stories occur when Terun and Siniwai —

F win the approval of their village

G decide to go hunting alone

H conquer their fears

J face danger for the first time

31 What do the main characters learn in these stories?

A To respect their elders

B To hunt as an animal hunts

C To use their weapons with greater skill

D To believe in themselves

32 Both stories end with a feeling of —

F frustration

G accomplishment

H concern

J relief

Read this selection. Then answer the questions that follow it.

Ride On, Sybil

Many inspiring stories and legends have their origins in the American Revolution, a conflict between the British and their American colonies. In the late 1700s, the colonists began their fight for independence from British rule. This is the legend of Sybil Ludington, a courageous 16-year-old who rode more than 20 miles on horseback to help defend her country.

My notes about what I am reading

1 Sybil had been riding her horse Star all night—more on this night than in the last two weeks combined. Despite his exhaustion, Star seemed to understand the urgency of the night and raced on. The dirt roads had turned to mud under the heavy rain, making it hard for Sybil to see.

2 Scrapes from low-hanging tree branches covered Sybil's face and arms. However, treating them would have to wait until morning when she had completed her task. Her father, Colonel Ludington, was counting on her to inform the colonial soldiers of a British attack. Although the task was dangerous, Sybil was intent on helping her father, a man she fiercely admired. She was proud of his role in the fight for American independence.

My notes about what I am reading

3 Sybil thought back to earlier that evening when she was tucking her brothers and sisters into their beds. She and her mother had heard approaching hoofbeats. They had looked at each other in alarm and gone quietly to the front door, trying not to disturb the children. With the war in progress, any unexpected visitor might be an unwelcome guest.

4 As soon as the rider caught sight of the women, he began to yell, "Colonel Ludington! Fetch Colonel Ludington! I must speak to him at once!" Sybil recognized the rider as one of her father's soldiers. An urgent message like this could mean only one thing—the British were attacking!

5 Sybil ran to find her father, her heart pounding in her chest. The colonel was in the back room studying a map that was laid out across his sturdy oak desk. His eyeglasses sat low on his nose. As Sybil entered the room, Colonel Ludington glanced up and saw the fear in his daughter's eyes. He quickly followed her to the front yard and calmly greeted the messenger. Sybil felt better just hearing the quiet authority in her father's voice.

6 The messenger was out of breath and soaking wet. "The news isn't good," he said, his hat pressed to his chest. He told them that the British had raided Danbury, Connecticut, the town where American military supplies had been hidden. The British confiscated everything they could use, destroyed the remainder of the supplies, and set fire to the town. The British were now marching to their ships, hoping to slip away with the stolen goods before the colonial soldiers caught them.

7 "We need to inform our men right away," Colonel Ludington responded. "If we can gather in time, we can prevent the British from reaching their ships. But our soldiers are scattered all over Putnam County and beyond. Are you fit to ride, son?"

8 The messenger, still gasping for air, said, "I can try, sir."

9 Sybil interrupted. "Father, let me ride. I know where to go, and you are needed here. Star and I are both rested."

10 Her father studied his 16-year-old daughter solemnly. Sybil stood tall and waited for his answer. "Very well," Colonel Ludington said. "Ride on, Sybil."

My notes about what I am reading

11 Nervous and excited, Sybil raced to the barn and forced herself to focus on saddling Star. She was not going to allow emotion to interfere with her mission. Her hands shook as she slipped the worn leather strap through the brass buckle.

12 Her mother entered the barn and offered her a bundle. "Take this cheese and rye bread. I've filled your father's canteen with water, and—" Her mother's eyes filled with tears. She embraced Sybil and returned to the warm glow of the house.

13 Sybil wished she could vanish into that safe light and nestle under the quilt on her bed. Everything was happening so quickly. Would she be able to alert the men in time? Would the British stop her?

14 "Time to go, boy." Sybil patted her horse, swung one leg over his back, and flew out into the darkness.

15 That had been hours ago. Now, despite her fatigue and rain-soaked clothing, Sybil urged Star on, aware that with each passing minute the British were getting farther away. Darkness enveloped her like a blanket, protectively surrounding her. She thought of her father's confidence in her, and her courage was renewed.

16 The rain slowed, and the moon finally appeared from behind wispy black clouds. It shone brightly, illuminating Sybil's path. She tried to memorize its appearance. The moon was her companion, reaching out with its soft light and whispering encouragement to her.

17 Sybil continued to gallop from town to town, banging on closed shutters and alerting the men in charge. She was aware of the significance of her ride. She knew of Paul Revere's heroic ride just two years earlier, in 1775. When her journey ended, Sybil would have ridden nearly twice as far as Revere.

18 The sun was beginning to rise when Sybil reached the last house on her route. She patted Star and turned wearily to begin the long journey home. From a distance she heard marching boots and a British officer shouting orders. Sybil slowed her horse, hoping to go unnoticed. They would probably never suspect her—she looked like an ordinary young girl out for an early ride—but it was best to be safe.

33 Which words from paragraph 5 help create an anxious feeling?

A *ran, pounding, fear*

B *studying, sturdy, glanced up*

C *map, authority, calmly*

D *back room, entered, followed*

34 What are paragraphs 11 and 12 mostly about?

F The way Sybil saddles her horse

G The food Sybil's mother brings her

H Why Sybil's hands are shaking

J How Sybil prepares for her journey

35 Sybil slows her horse as she passes the British camp because she wants to —

A keep from raising the enemy's suspicion

B listen to the sounds of marching

C give her horse the chance to regain his strength

D find out what the enemy soldiers are doing

36 Read this sentence from paragraph 3.

> *Sybil thought back to earlier that evening when she was tucking her brothers and sisters into their beds.*

The author uses this sentence to —

F set up a flashback

G provide suspense

H foreshadow an event

J establish the setting

37 How does the author organize the selection?

A By comparing Sybil's ride to Paul Revere's ride

B By listing the reasons why Sybil supports the war

C By giving the cause and listing the effects of the ride Sybil makes

D By describing Sybil's legendary ride and the events that led up to it

38 Which of these is the best summary of the story?

F Sybil is upset when a soldier arrives at her door. She turns to her father and offers her help. Her father allows her to ride her horse throughout the night.

G Sybil is worried when one of her father's soldiers comes to their house with news of the British troops. Sybil offers to alert the colonial soldiers. By making a daring night ride, she is able to spread the news before morning.

H Sybil helps her father in the Revolutionary War. He agrees to let her ride her horse on a mission. Sybil knows she must get news to the soldiers.

J Sybil loves to ride and knows the roads in Putnam County. When her father needs someone to make a long journey, Sybil tells him that she and Star can do the job. Sybil rides her horse farther than Paul Revere did in his legendary ride.

39 Read this sentence from paragraph 11 of the story.

> *She was not going to allow emotion to interfere with her mission.*

This sentence shows Sybil's —

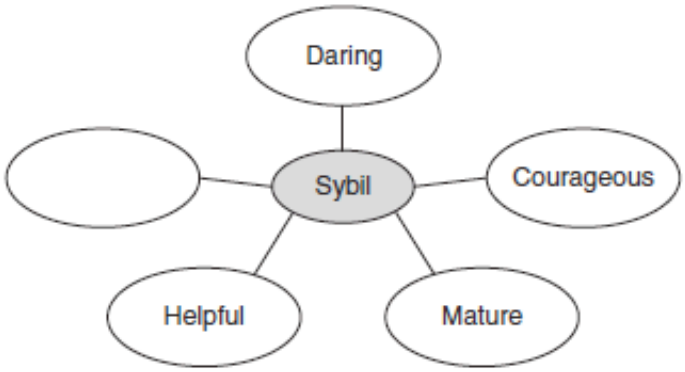
A patience

B surprise

C hesitation

D determination

40 Look at the graphic organizer.



Which character trait best completes the graphic?

F Annoyed
G Humorous
H Quiet
J Responsible

---

41 What is Sybil's biggest conflict in the story?

A Completing her task in time
B Motivating Star to gallop faster
C Avoiding capture by the British troops
D Persuading her father to let her go

42 In paragraph 6, the word confiscated means —

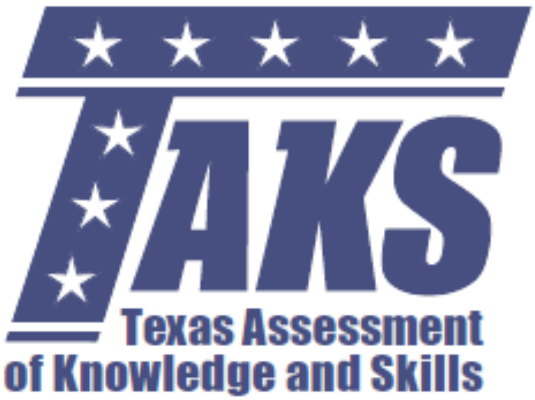
F pushed around
G buried
H took control of
J replaced

Texas Assessment of Knowledge and Skills - Answer Key

Grade: 06
Subject: Reading
Administration: April 2009

Item Number	Correct Answer	Objective Measured	Student Expectations
01	B	01	6.10 (F)
02	H	01	6.10 (F)
03	B	03	6.12 (A)
04	J	04	6.11 (C)
05	D	01	6.9 (D)
06	G	01	6.10 (G)
07	D	02	6.12 (J)
08	G	04	6.10 (H)
09	D	04	6.11 (C)
10	G	02	6.12 (F)
11	B	01	6.10 (F)
12	F	03	6.10 (E)
13	D	01	6.9 (B)
14	G	04	6.10 (H)
15	C	03	6.10 (L)
16	F	03	6.12 (A)
17	B	04	6.12 (I)
18	H	01	6.9 (B)
19	A	04	6.11 (C)
20	F	04	6.10 (H)
21	B	03	6.10 (E)
22	H	01	6.10 (F)
23	A	02	6.12 (G)
24	G	04	6.11 (C)
25	B	02	6.12 (F)
26	F	01	6.10 (F)
27	B	03	6.10 (E)
28	H	04	6.10 (H)
29	A	01	6.9 (B)
30	H	02	6.12 (G)
31	D	04	6.11 (D)
32	G	04	6.12 (K)
33	A	04	6.12 (K)
34	J	01	6.10 (F)
35	A	03	6.10 (E)
36	F	02	6.12 (J)
37	D	04	6.12 (I)
38	G	01	6.10 (G)
39	D	02	6.12 (F)
40	J	03	6.10 (L)
41	A	02	6.12 (G)
42	H	01	6.9 (B)

STUDENT NAME _____



GRADE 6
MATHEMATICS

Mathematics Chart

LENGTH

Metric	Customary
1 kilometer = 1000 meters	1 mile = 1760 yards
1 meter = 100 centimeters	1 mile = 5280 feet
1 centimeter = 10 millimeters	1 yard = 3 feet
	1 foot = 12 inches

CAPACITY AND VOLUME

Metric	Customary
1 liter = 1000 milliliters	1 gallon = 4 quarts
	1 gallon = 128 fluid ounces
	1 quart = 2 pints
	1 pint = 2 cups
	1 cup = 8 fluid ounces

MASS AND WEIGHT

Metric	Customary
1 kilogram = 1000 grams	1 ton = 2000 pounds
1 gram = 1000 milligrams	1 pound = 16 ounces

TIME

1 year = 365 days

1 year = 12 months

1 year = 52 weeks

1 week = 7 days

1 day = 24 hours

1 hour = 60 minutes

1 minute = 60 seconds

Mathematics Chart

Perimeter	square	$P = 4s$
	rectangle	$P = 2l + 2w$ or $P = 2(l + w)$
Circumference	circle	$C = 2\pi r$ or $C = \pi d$
Area	square	$A = s^2$
	rectangle	$A = lw$ or $A = bh$
	triangle	$A = \frac{1}{2}bh$ or $A = \frac{bh}{2}$
	trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$ or $A = \frac{(b_1 + b_2)h}{2}$
	circle	$A = \pi r^2$
Volume	cube	$V = s^3$
	rectangular prism	$V = lwh$
PI	π	$\pi = 3.14$ or $\pi = \frac{22}{7}$

DIRECTIONS

Read each question. Then fill in the correct answer on your answer document. If a correct answer is not here, mark the letter for "Not here."

SAMPLE A

Find the greatest common factor of 12 and 18.

A 3

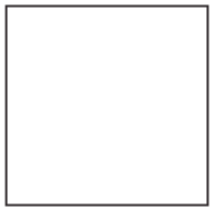
B 6

C 9

D Not here

SAMPLE B

Find the perimeter of this square rug in meters.



Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

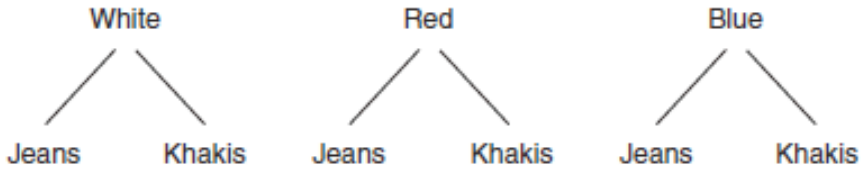
1 Wayne is picking an outfit to wear to school. His choices are shown in the table below.

Wayne's Outfits

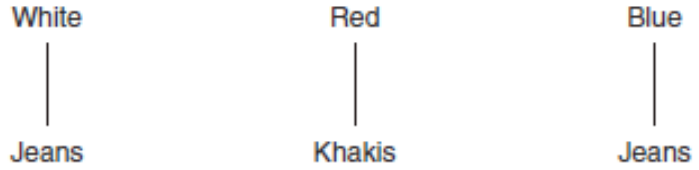
Shirt Color	Pants
White	Jeans
Red	Khakis
Blue	

Which of the following diagrams shows all the possible outcomes if Wayne picks 1 shirt and 1 pair of pants to wear?

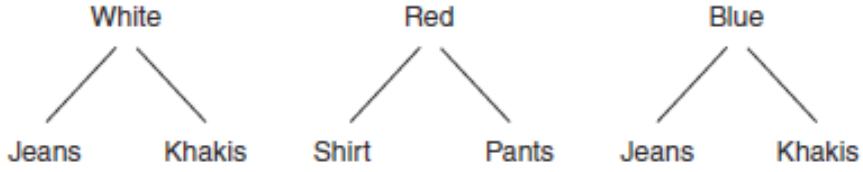
A



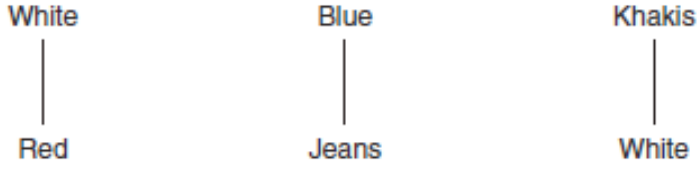
B



C



D



2 The diameter of the circular top of an oatmeal container is 10 centimeters.

Which of the following expressions can be used to determine the circumference of the top of the oatmeal container in centimeters?

F $10 \div \pi$

G $20 \times \pi$

H $20 \div \pi$

J $10 \times \pi$

3 A teacher has 32 students in her class. She wants to put the students into groups so that each group has the same number of students. Which of the following does NOT represent the number of students she could put into groups?

A 4

B 10

C 8

D 16

4 Sally wrote two number patterns, as shown below.

Set R = {2, 4, 6, 8, 10, . . .}

Set T = {4, 8, 12, 16, 20, . . .}

If these patterns continue, which of the following numbers would appear in both Set R and Set T?

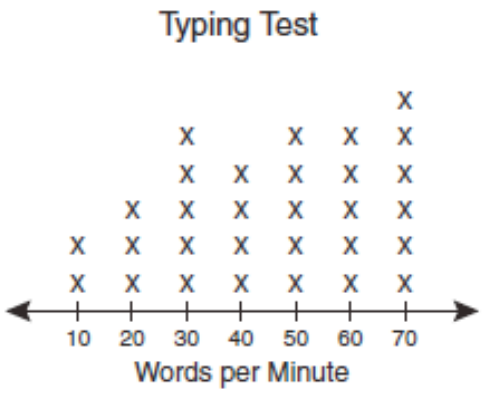
F 46

G 30

H 52

J 70

5 Some students took an online typing test. The line plot below shows the number of students who typed different numbers of words per minute.



Which table correctly represents the information in this line plot?

A

Typing Test

Words per Minute	Number of Students
10	20
20	60
30	150
40	160
50	250
60	300
70	420

C

Typing Test

Words per Minute	Number of Students
20	10
60	20
150	30
160	40
250	50
300	60
420	70

B

Typing Test

Words per Minute	Number of Students
2	10
3	20
5	30
4	40
5	50
5	60
6	70

D

Typing Test

Words per Minute	Number of Students
10	2
20	3
30	5
40	4
50	5
60	5
70	6

6 The table below shows the base length and area of several triangles. All these triangles have a height of 8 feet.

Triangles

Base, b (feet)	Area, A (square feet)
4	16
8	32
12	48
16	64

Which of the following equations best represents the relationship between the base, b, and area, A, of these triangles?

F $A = \frac{b}{4}$

G $A = b^2$

H $A = 4b$

J $A = b + 12$

7 Which of the following statements about angle measures is true?

A An angle that measures 90° is a straight angle.

B An angle that measures 25° is an obtuse angle.

C An angle that measures 180° is a right angle.

D An angle that measures 88° is an acute angle.

8 The picture below is a scale drawing of a rectangular bulletin board. Use the ruler on the Mathematics Chart to measure the dimensions of the scale drawing to the nearest inch.

Scale
1 inch = 2 feet

Which of the following is closest to the perimeter in feet of the actual bulletin board?

F 32 ft

G 76 ft

H 16 ft

J 48 ft

---

9 Edward has 65% of a garden planted with lilies. Which fraction is equivalent to 65%?

A $\frac{13}{2,000}$

B $\frac{7}{20}$

C $\frac{65}{1}$

D $\frac{13}{20}$

10 Martha gives her plants a total of 2,000 milliliters of water each day. What is the total volume of water in liters that she gives her plants over 3 weeks?

F 2 L

G 6 L

H 42 L

J 60 L

11 Liza is learning about hummingbirds. She learned that the bee hummingbird can weigh 0.07 ounce and that the giant hummingbird can weigh 7 ounces. What is the difference between these two weights?

A 6.93 oz

B 7.07 oz

C 6.97 oz

D 0.63 oz

12 Rosanne took a total of 2 hours to write 30 party invitations. Which of the following equations can be used to find m, the number of minutes Rosanne took to write 1 invitation?

F $(60 \div 30) \div 2 = m$

G $(60 \times 30) + 2 = m$

H $(60 \div 2) \times 30 = m$

J $(60 \times 2) \div 30 = m$

13 Denise kept track of how much time she spent on her homework 4 days last week.

Homework

Day	Time (minutes)
Monday	100
Tuesday	120
Wednesday	45
Thursday	90

What is the total amount of time Denise spent on her homework these 4 days?

A 4 hours 25 minutes

B 5 hours 55 minutes

C 4 hours 15 minutes

D 3 hours 55 minutes

14 The list below shows the number of students out of 30 who chose different foods in the cafeteria.

- 11 students chose pizza.
- 4 students chose hamburgers.
- 3 students chose tacos.
- ? students chose salad.

How many students chose salad?

F 18, because $11 + 4 + 3 = 18$

G 26, because $30 - (11 - 4 - 3) = 26$

H 12, because $30 - 11 - 4 - 3 = 12$

J 20, because $30 - (11 - 4) - 3 = 20$

15 Mr. Drake bought muffins and drinks for a breakfast meeting. The muffins were sold in packages of 12, and the drinks were sold in packages of 18. What is the smallest number of packages of each item that Mr. Drake could have bought and still have the same number of muffins and drinks?

A 2 packages of muffins
3 packages of drinks

B 18 packages of muffins
12 packages of drinks

C 3 packages of muffins
2 packages of drinks

D 6 packages of muffins
9 packages of drinks

16 Susie drove from her house to the park. She drove 15 blocks east, 10 blocks north, 15 blocks west, 5 blocks north, and stopped at the park. Where is the park in relation to Susie's house?

F 15 blocks north

G 5 blocks north

H 45 blocks west

J 15 blocks east

17 Which pair of numbers are equivalent?

A 0.5, $\frac{1}{5}$

B 0.06, $\frac{6}{10}$

C $\frac{7}{10}$, 0.07

D $\frac{8}{100}$, 0.08

18 Alex has a box of 100 colored drinking straws. The box contains 30 red straws, 35 green straws, 20 yellow straws, and 15 purple straws. If he selects 1 straw without looking, what is the probability it will be yellow?

F $\frac{1}{5}$

G $\frac{4}{5}$

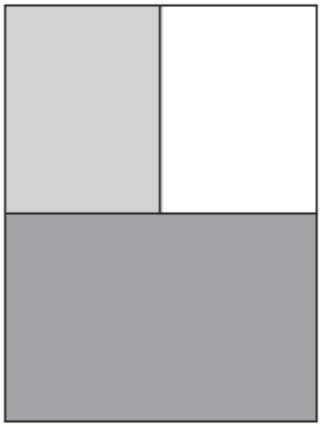
H $\frac{3}{10}$

J $\frac{3}{7}$

19 Mr. Perry bought a computer for $1,920, including tax. If he pays for it in 16 equal payments, what will be the dollar amount of each payment?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

20 Newspaper advertisements can be $\frac{1}{4}$ of a page, $\frac{1}{2}$ of a page, or a full page. The shaded parts of the model below show the fractions of a page used for two advertisements.



Which of the following equations represents the total fraction of the page used for these two advertisements?

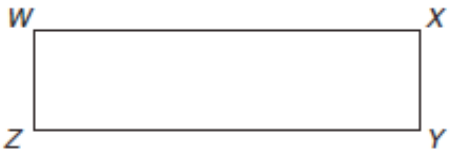
F $\frac{1}{3}+\frac{1}{3}=\frac{2}{3}$

G $\frac{1}{4}+\frac{1}{2}=\frac{3}{4}$

H $\frac{1}{4}+\frac{3}{4}=\frac{2}{4}$

J $\frac{1}{2}+\frac{1}{2}=\frac{4}{4}$

21 If quadrilateral $WXYZ$ is a rectangle, which statement about this rectangle must be true?



A The measures of $\angle W$ and $\angle X$ add up to 90°.

B $\angle Y$ and $\angle Z$ are not congruent.

C The measures of $\angle W$ and $\angle Y$ add up to 180°.

D All the angles are acute.

22 Coach Abdi needs to buy 12 T-shirts for the girls' basketball team. The list below shows the prices of T-shirts at 2 stores.

- Store X: One T-shirt costs $12.
- Store Y: A package of 6 T-shirts costs $60.

What is the amount of money Coach Abdi will save if she buys 12 T-shirts at Store Y?

F $264

G $48

H $216

J $24

23 The table below shows how the volume of a rectangular prism changes as its width increases and its length and height remain the same.

Rectangular Prisms

Width, w (inches)	Volume, V (cubic inches)
5	400
7	560
9	720
10	800

Which of the following equations best represents the relationship between the rectangular prism's width, w, and its volume, V?

A $V = 20w + 300$

B $V = 80w$

C $V = w \div 80$

D $V = w + 395$

24 Mrs. Rudolf bought 3 frozen pizzas and a gallon of ice cream at a grocery store. Mrs. Rudolf knows her total bill and knows that the ice cream was $2.89, but she wants to find the price for the pizza. How can she determine the cost of each frozen pizza?

F Divide the total bill by 3 and then subtract $2.89 from the quotient

G Multiply $2.89 by 3 and then subtract the product from the total bill

H Subtract $2.89 from the total bill and then divide the difference by 3

J Subtract $2.89 from the total bill and then multiply the difference by 3

25 Jonah measured the length of his thumb in centimeters. The length of his thumb was between 4.5 and 4.6 centimeters. Which of the following could have been the length of his thumb?

A 4.06 cm

B 4.51 cm

C 4.48 cm

D 4.61 cm

26 Tracy, Rob, and Gwen each bought different supplies for a class party. Tracy spent $5 more than Gwen. Gwen spent $3 less than Rob. Rob spent $8. What is the total amount of money Tracy, Rob, and Gwen spent on supplies?

F $16

G $25

H $10

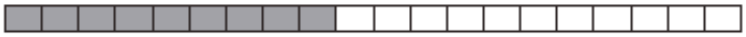
J $23

27 Which of the following models shows 45% shaded?

A 

B 

C 

D 

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28 A circular puzzle has a circumference of about 50 inches. Which expression can be used to find the approximate radius of the puzzle?

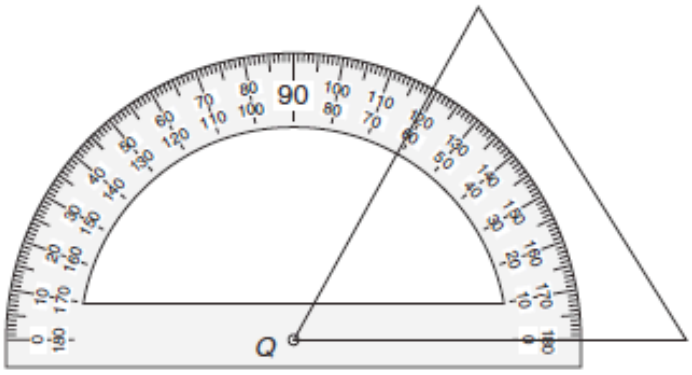
F $50 \div \pi$

G $50 \div (2\pi)$

H $50 \cdot (2\pi)$

J $50 \cdot \pi$

29 What is the measure of $\angle Q$ to the nearest degree?



A 79°
B 119°
C 121°
D 61°

---

30 What is the value of the expression below?

$$20 - 3 \times (2 + 4)$$

F 38
G 18
H 2
J 10

31 A restaurant has a total of 30 employees. There are 14 employees who work in the evening, and the rest work during the day. What is the ratio of the number of employees who work in the evening to the number of employees who work during the day?

A 7:8
B 7:15
C 8:7
D 8:15

32 Mario counted 21 buses in the parking lot at a band competition. If there were between 33 and 37 students on each bus, which is the best estimate of the total number of students on the buses?

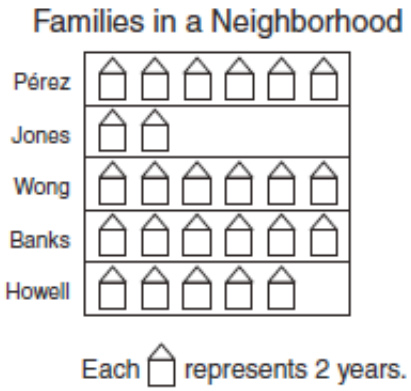
F 91

G 600

H 700

J 875

33 The graph below shows the number of years that 5 families have lived in a neighborhood.



What is the mean number of years these families have lived in this neighborhood?

A 10 years

B 6 years

C 12 years

D 5 years

34 Janette has a spinner with 8 equal sections. Each section is labeled red, green, or yellow. What additional information is needed to find the probability of the arrow landing on a red section on the next spin?

F The radius of the spinner

G The circumference of the spinner

H The number of times Janette has landed on a green section

J The number of sections of each color

35 Karla is using nails to build birdhouses. The table below shows n, the number of nails she used to build b, different numbers of birdhouses.

Karla's Birdhouses

Number of Birdhouses, b	Number of Nails, n
2	22
3	33
4	44
5	55

If Karla keeps following this pattern, which of the following expressions can she use to find n, the number of nails it will take to build b birdhouses?

A $b - 11$

B $11b$

C $b + 11$

D $\frac{b}{11}$

36 What is the prime factorization of 550?

F $2 \cdot 275$

G $2 \cdot 5^2 \cdot 55$

H $2 \cdot 25 \cdot 11$

J $2 \cdot 5^2 \cdot 11$

37 The diameter of a circular plate is approximately 6 inches. Which of the following is closest to the circumference of the plate?

A 36 in.

B 108 in.

C 18 in.

D 54 in.

38 Five classes from East View Middle School went on a field trip.

- Two classes had 25 students each.
- The other classes had 23 students each.

What was the total number of students who went on the field trip?

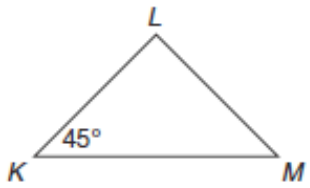
F 119

G 48

H 240

J 53

39 In the triangle below, $\angle K$ is congruent to $\angle M$.



What is the measure of $\angle L$?

A 45°

B 180°

C 135°

D 90°

40 A candy company advertises that 3 out of 24 of its chocolate candy bars contain a prize. Based on this information, how many chocolate candy bars out of 120 should contain a prize?

F 15

G 24

H 27

J 29

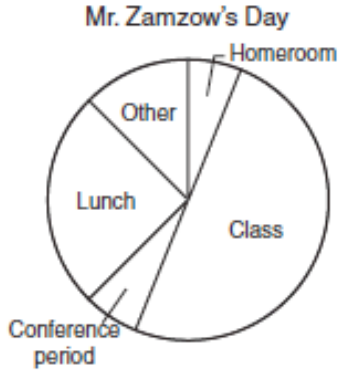
41 Mr. Zamzow recorded the number of hours he spent on various activities during an 8-hour school day. The results are shown in the table below.

Mr. Zamzow's Day

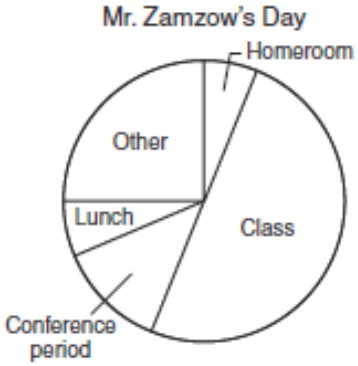
Activity	Time (hours)
Homeroom	$\frac{1}{2}$
Class	4
Conference period	1
Lunch	$\frac{1}{2}$
Other	2

Which of the following graphs best represents the percentage of time Mr. Zamzow spent on each activity?

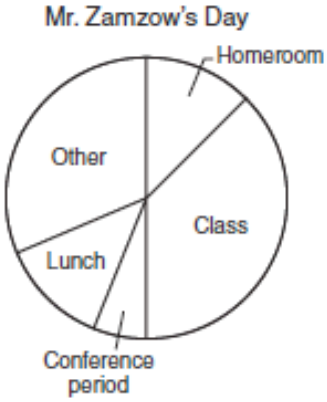
A



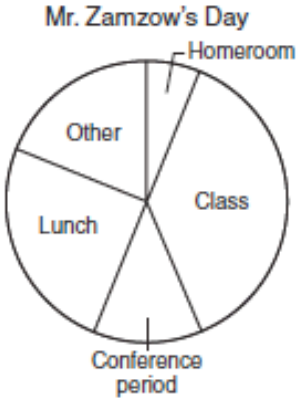
C



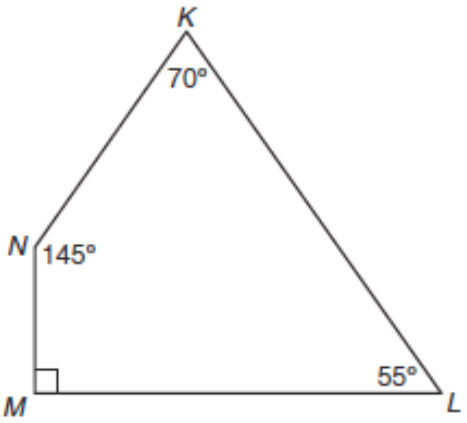
B



D



42 In quadrilateral *KLMN*, what type of angle is $\angle KNM$?



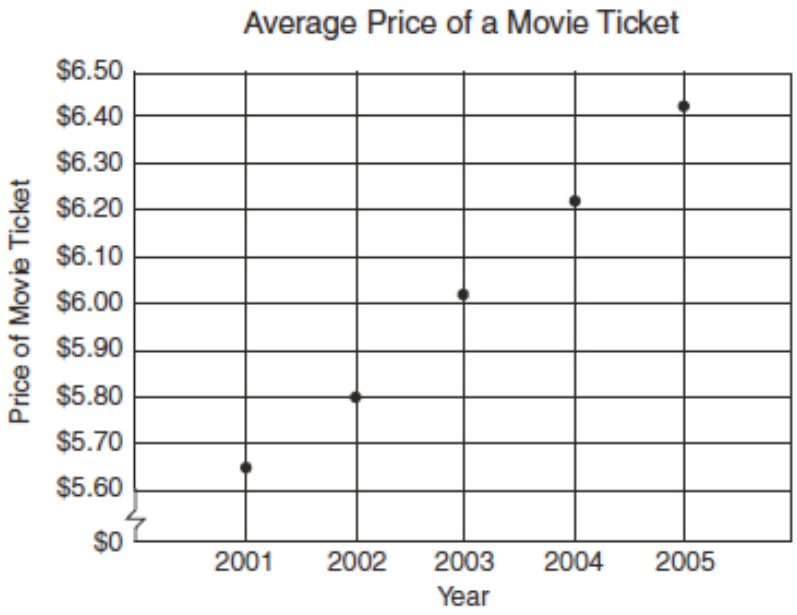
F Acute

G Obtuse

H Right

J Straight

43 The graph below shows the average price of a single movie ticket in the United States each year from 2001 to 2005.



Which of the following statements is supported by the information in the graph?

A The greatest decrease in the average price of a movie ticket during this period occurred between 2003 and 2004.

B The range of the prices is more than $1.

C The median price is about $5.

D The smallest increase in the average price of a movie ticket during this period occurred between 2001 and 2002.

44 A secretary answered 88 phone calls in a day. Of these phone calls, 18 were from Plano, Texas. What is the ratio of the number of phone calls that were from Plano to the total number of phone calls that day?

F 9 to 44

G 9 to 35

H 35 to 44

J Not here

45 Diego subtracted 2 from the number of sides in an octagon. Then he multiplied this difference by 180 and divided the product by the number of sides of an octagon. If he did all this correctly, what was his final value?

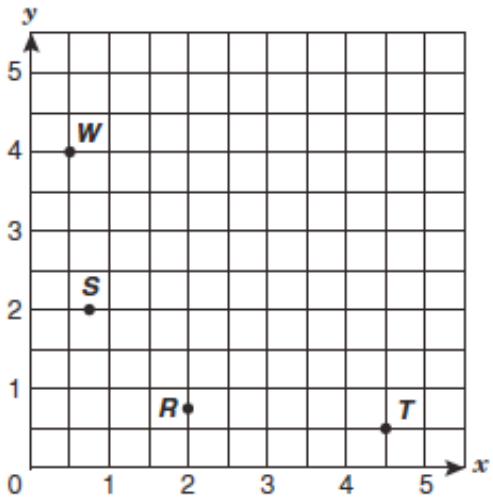
A 45

B 225

C 60

D 135

46 Look at the grid below.



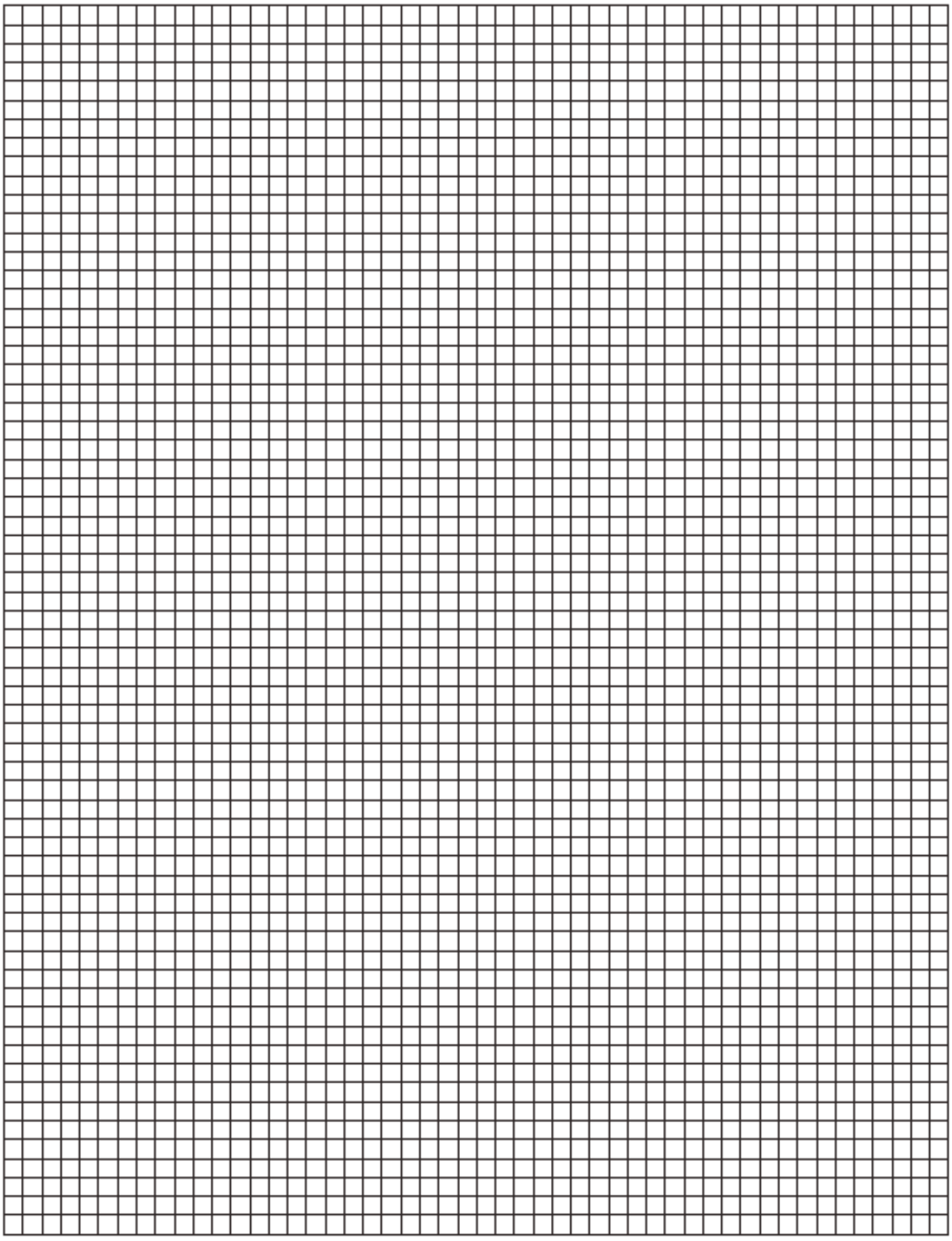
Which of the following ordered pairs best represents the location of point T?

F $(4\frac{1}{2}, \frac{1}{2})$

G $(2, \frac{1}{2})$

H $(\frac{1}{2}, 4\frac{1}{2})$

J $(\frac{1}{2}, 2)$

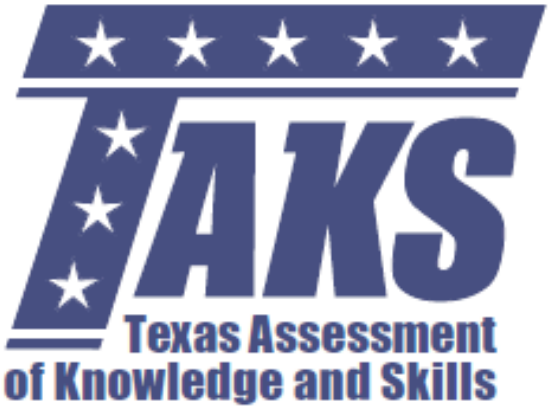


Texas Assessment of Knowledge and Skills - Answer Key

Grade: 06
Subject: Mathematics
Administration: April 2009

Item Number	Correct Answer	Objective Measured	Student Expectations
01	A	05	6.9 (A)
02	J	03	6.6 (C)
03	B	01	6.1 (E)
04	H	06	6.13 (A)
05	D	05	6.10 (A)
06	H	02	6.4 (B)
07	D	03	6.6 (A)
08	F	04	6.8 (B)
09	D	02	6.3 (B)
10	H	04	6.8 (D)
11	A	01	6.2 (B)
12	J	02	6.5 (A)
13	B	04	6.8 (B)
14	H	06	6.13 (B)
15	C	01	6.1 (F)
16	F	06	6.11 (C)
17	D	01	6.1 (B)
18	F	05	6.9 (B)
19	120	01	6.2 (C)
20	G	01	6.2 (A)
21	C	03	6.6 (B)
22	J	06	6.11 (B)
23	B	02	6.4 (B)
24	H	06	6.12 (A)
25	B	01	6.1 (A)
26	J	06	6.11 (C)
27	D	02	6.3 (B)
28	G	03	6.6 (C)
29	D	04	6.8 (C)
30	H	01	6.2 (E)
31	A	02	6.3 (A)
32	H	01	6.2 (D)
33	A	05	6.10 (B)
34	J	06	6.11 (A)
35	B	02	6.4 (A)
36	J	01	6.1 (D)
37	C	04	6.8 (A)
38	F	06	6.11 (A)
39	D	03	6.6 (B)
40	F	02	6.3 (C)
41	C	05	6.10 (C)
42	G	03	6.6 (A)
43	D	05	6.10 (D)
44	F	02	6.3 (A)
45	D	06	6.11 (B)
46	F	03	6.7 (A)

STUDENT NAME _____



GRADE 7
READING

Read this selection. Then answer the questions that follow it.

Being Michael Bevons

My notes about what I am reading

1 "Michael Bevons," the teacher called. "Michael Bevons."

2 It was clear to everyone in the room that the teacher was calling my name. I was, after all, the new kid. I was expected to parade to the front of the room so all the students could stare at this person named Michael Bevons.

3 Such was my fate. This change was set in motion two months ago when my mother broached the subject of moving from burning-hot Texas to tolerably hot Southern California. Even though this was the first I'd heard of it, I didn't really have any objections. I was sure that I would make a lot of friends in California. Everyone knows that people there are more open-minded than anywhere else. In the small Texas town where we lived, people didn't understand why I love skateboarding and punk music. My mother was excited about her new job. Plus, she would be living near my aunt. Although I didn't exactly share in the joy of being near my younger cousins, I figured the new scene would suit me just fine.

4 But after we arrived, my conception of California changed completely. No one in my neighborhood seemed to share my interests. I happened to move to a place in California where everything is about being in or on the water. I had lived in West Texas my whole life, and I had never even been to a beach. I quickly discovered that sand is no good for skateboarding. And as far as music, I think cricket symphonies are the only thing my new neighbors listen to. When I wasn't practicing guitar, the neighborhood was nearly silent. I rode my skateboard alone on the sidewalk and played only solos on my guitar.

5 I felt right at home today while riding the bus to school—I had been alone in West Texas, and I was alone here. The bus crawled along as kids murmured questions like "What's his deal?" about the new person on board. My hair, a carefully spiked Mohawk, appeared to be the focus of every conversation.

6 I didn't get it. I had thought that in California, people would know that being different was cool. Nope. I was still just that weirdo that people hoped would not sit next to them. But I wasn't about to go home and change my

My notes about what I am reading

hairstyle. Then I'd lose what dignity I had left. So I walked into the classroom anyway.

7 "Would you like to come get your book, Michael?" the teacher asked.

8 "Actually, no," I thought. But I knew I didn't have a choice.

9 In the few moments before I was to make my move, I had already calculated the number of steps it would take to reach her desk—nine. I hoped to blaze the path with the quickness of a sprinter. As I took each step, I cringed, thinking at any point that the whispering would start again.

10 "We're starting a new chapter today, so you came on a good day, Michael," the teacher said cheerfully. She was holding out the book with both hands and smiled as I took it from her.

11 "One more thing," she said. "Robert will show you around today."

12 "All right," I muttered before starting back to my seat.

13 "He's the class clown," the teacher said, "so don't let him annoy you too much." She seemed to be addressing Robert rather than me.

My notes about what I am reading

14 As I scanned the room, one student hopped on his chair and started acting like a monkey, miming the peeling of a banana and grunting. "He's the class monkey today," a student near him said.

15 Robert was the perfect shield. While he was distracting the other students, I quickly retreated to my desk.

16 The rest of the class time went by fairly quickly. Fortunately, everyone appeared engaged with the teacher's lesson, so no one was looking my way. When the bell rang, I let most of the students exit before I did. Robert came to my side and asked what was next on my schedule.

17 "Science—Room 120B," I said.

18 "You're going to love that," Robert said.

19 "Really?" I asked.

20 "No, not at all. I was kidding," he quickly replied, smiling. "I'm in there, too, and it's a true test of my clowning skills to make that class interesting."

21 So we walked together to Room 120B. Robert told me to take a desk near his. After science was math. I was on my own, since Robert went to band class then.

22 Robert peeked at my schedule before he left and saw that we both had lunch at the same time. He told me to wait for him outside my math class. I did. I waited and waited, but Robert didn't show up. I told myself I should have known better and started toward the lunchroom alone.

23 Then I heard someone call, "Hey, Michael. Wait up." Robert was lugging a tuba case.

24 That was when I began to think that this move might just work out O.K. "Dude, you play the tuba? That could be so punk!" I said. "Let me tell you what I've got in mind."

1 At first, why is Michael mostly pleased about moving to California?

A He knows he can skateboard there.

B He wants to meet others who share his interests.

C He thinks the weather will be more comfortable.

D He can play guitar there.

2 What message does the author convey throughout the selection?

F How you look is not as important as the way you think.

G Meeting people who are like you can happen at any time.

H If you move to a new place, be prepared to encounter strange people.

J It is important to be yourself even though it may be difficult.

3 Paragraphs 8 and 9 are mainly about Michael's desire to —

A get to know his teacher

B get his new book

C avoid attention

D count the number of steps he takes

4 The author organizes this selection by —

F explaining why Michael wears a Mohawk

G comparing Michael's reasons for wanting to move with his mother's reasons

H listing facts about Michael's new neighborhood in order of importance

J describing Michael's awkward start to his first day and how things improve

5 Look at the diagram below.

Michael	Michael and Robert	Robert
Is the new student	Draw the attention of others	Is the class clown
Has a Mohawk		Acts like a monkey
Plays guitar	Like music	Plays tuba

Which of the following would best belong under "Michael and Robert"?

A Enjoy being different
B Mock other students
C Follow popular trends
D Try to be funny

---

6 In paragraphs 1 and 2, the author creates a mood of —

F confusion
G uneasiness
H sadness
J anger

7 What is Michael's main conflict in this selection?

A Wanting to be liked for himself
B Having to be around his cousins
C Finding a place to skateboard
D Avoiding talking to other kids

8 When Robert does not show up right away after math class, Michael starts walking toward the lunchroom because —

F he hopes to meet Robert there

G he is too hungry to wait

H he thinks he has been abandoned

J he wants to get a good seat

9 The kids on the bus appear to view Michael's hair as —

A fashionable

B boring

C unusual

D threatening

10 In paragraph 15, why does Michael say that Robert is "the perfect shield"?

F Michael needs help finding his way around the school.

G Robert can protect Michael from unwanted attention.

H Michael believes that Robert is fun to be around.

J Robert has a talent for making people laugh.

11 Michael first realizes California is not the way he thought it would be after he —

A sits in his first class

B meets other students

C takes his first ride on the school bus

D examines his new neighborhood

12 The reader can conclude that when Michael sees Robert's tuba case, he —

F thinks Robert will want to learn to play other instruments

G thinks Robert will have to return to band practice

H wants to help Robert carry the instrument

J hopes to play music with Robert

Read this selection. Then answer the questions that follow it.

What's the Weirdest Thing About Austin?

Residents of Austin, Texas, are proud of their city's uniqueness. For this reason the slogan "Keep Austin Weird" was created in 2000. An Austin middle school recently held an essay contest called "What's the Weirdest Thing About Austin?" Here are three of the essays submitted by students.

Time for a Pun-Off

by Allison Peters

1 Do you love to play with words? Maybe you'd rather just sit back and listen to others do so. Every year in May, I watch my father participate in one of the wackiest events in Austin. He stands up in front of an audience and tells terrible jokes. One year his jokes were so bad that he won a prize!

2 Just what is this crazy contest? It's the O. Henry Pun-Off World Championships, of course! The contest is named for O. Henry, the famous American writer. Apart from his masterful storytelling, he is remembered for his talent for punning. A pun is a kind of joke that plays with words that sound similar but have different meanings. Here's an example: "When a clock is hungry, it goes back four seconds." The word *seconds* could refer to a unit of time or an extra portion of food. No, it's not exactly funny, but a groan is as good as a gold medal for an accomplished punster.

3 The annual O. Henry Pun-Off World Championships are held at the O. Henry Museum, the writer's former Austin home. The competition began in 1977 with two separate contests. The first is called the Punniest of Show. Each contestant performs a prepared routine for an audience. Four judges then decide the winner. The second part is the High-Lies and Low-Puns Contest, where 32 contestants split up into pairs. After receiving their topic, each pair must pun back and forth together as quickly as possible, trading jokes and puns in a mad game of verbal tennis. In the end the funniest and longest-lasting punster wins.

4 It's amazing to hear these word masters come up with hilarious puns under pressure. If you love language and enjoy hearing people play with words, come to the O. Henry Pun-Off—it's definitely weird!

Racing Austin Style

by Cameron Elizondo

5 The only thing better than taking part in the fifth-largest race in the country is running it while wearing an outrageous costume. Since 1978, the *Statesman* Capitol 10K has drawn about 15,000 runners annually. It attracts attention for its size *and* for its wackiness.

6 Each year near the beginning of April, people gather together on a Sunday morning to run through the city. Serious runners usually compete in conventional running clothes—shorts and running shoes. But for many participants, having fun is more important than winning. These runners dress in the most creative costumes imaginable. Many are representative of the city. For example, in 2006 a runner came dressed as an Austin street sign. Another runner was dressed as

the University of Texas tower, a well-known local landmark. Costumes in past years have included a chicken head and an armadillo. One group even ran as a giant centipede. You'd think it would be difficult to run 6.2 miles through downtown while wearing a costume, but hundreds of people do it every year!

7 The race, organized by the *Austin American-Statesman* newspaper, brings in money for various charity organizations, as much as $1.5 million since 1993. About 2,000 volunteers donate their time to make the race a success. Many Austin residents consider this event to be a race, a costume parade, and a block party, all in one. Come out to the next *Statesman* Capitol 10K! You'll get fit, help raise money for a worthwhile charity, and have fun too!

All You Need Is SPAM

by Paul Thuyen

8 How many main ingredients do you need to create a magnificent meal? The folks at SPAMARAMA would probably say, "Just one!" If you like to eat or prepare unusual foods, Austin is the perfect venue to satisfy your appetite.

9 SPAMARAMA is definitely the strangest event in Austin—and probably in all of Texas. It's a festival that celebrates SPAM, a canned pork product. In 1976 David Arnsberger and Dick Terry started the tradition as a fun alternative to the ever-popular chili cook-off. About 10,000 people come each year to sample fabulous recipes created for the SPAM cooking contest. Some entries in this cook-off are familiar dishes like SPAM sandwiches and casseroles, while others, such as SPAM ice cream, Moo Goo Gai SPAM, and GuacaSPAMole, are true novelties.

10 The contest has two divisions: one for professional chefs and restaurant owners, and one for amateur cooks. In the amateur division, everyone is welcome to show their stuff. One contestant entered the contest with a dish that was a mixture of cheddar cheese, mayonnaise, SPAM, and raisins. The dish's poor rating at the contest did not deter this stubborn individual. Hoping to find a more accepting panel of judges, he froze his entry and brought it back the following year. In keeping with the spirit of the event, the judges decided to create a "last-place-even-if-there-were-a-hundred-entries" award just for him.

11 But the cook-off isn't the only event that pulls in audiences at SPAMARAMA. Those who don't want to actually eat SPAM can play with it instead. The SPAM toss (similar to an egg toss) is entertaining to watch, and so is the Tug-of-War that takes place across a huge vat of SPAM jelly. Artistic types can enjoy the SPAM-carving display, which features "SPAM sculptures" of animals, people, and much more.

12 SPAMARAMA takes place annually on the first weekend of April. Not surprisingly, the event often falls on—or close to—April Fool's Day, but it's 100% real! And there's still time for you to create next year's award-winning recipe.

13 In paragraph 2, the words "a groan is as good as a gold medal" suggest that —

A receiving a groan in response to a pun is a mark of success

B people cast their votes for a contestant by groaning

C competitors often make strange noises for effect

D actual prizes are never awarded at pun-offs

14 Which of these sentences from "Racing Austin Style" is an opinion?

F *Costumes in past years have included a chicken head and an armadillo.*

G *Another runner was dressed as the University of Texas tower, a well-known local landmark.*

H *The only thing better than taking part in the fifth-largest race in the country is running it while wearing an outrageous costume.*

J *Each year near the beginning of April, people gather together on a Sunday morning to run through the city.*

15 In paragraph 3, the phrase "trading jokes and puns in a mad game of verbal tennis" helps the reader understand —

A the pace and competitiveness of the event

B how difficult it is to watch a pun-off

C the amount of time required to compete in a pun-off

D why contestants are divided into pairs

16 What does the word venue mean in paragraph 8?

F People

G Location

H Challenge

J Restaurant

17 One contestant in the SPAMARAMA froze his food entry because he —

A planned to carve it

B missed the entry deadline

C wanted it to be eaten cold

D thought he deserved to win

18 Which of the following is the best summary of the selection?

F Every year local residents and visitors alike help demonstrate the spirit behind the slogan "Keep Austin Weird" by taking part in some unusual events. The O. Henry Pun-Off attracts people who enjoy wordplay, while the Capitol 10K lures both serious and fun runners. SPAMARAMA attracts those who might want to cook, sample, or play with SPAM.

G People in Austin, Texas, take great pride in being different from other Texans. This pride has inspired Austin residents to create unusual events such as a 10K race in which people wear creative costumes. The city even has a slogan, "Keep Austin Weird," which captures the city's spirit.

H One of the ways that residents of Austin, Texas, are trying to live up to the slogan "Keep Austin Weird," which was adopted in 2000, is by hosting events unlike any that are held elsewhere in the state. One of the most unusual of these events is SPAMARAMA. Each year many people come out to compete in cooking and carving this meat product.

J Austin, Texas, hosts three unusual events every year. One of these events is a race in which runners wear unusual costumes as they run through the streets of the city. Another of these events is a punning contest. This contest is held in honor of one of Austin's most famous former residents, the author O. Henry.

19 A walking street sign might be found at —

A the *Austin American-Statesman*

B the *Statesman* Capitol 10K

C the O. Henry Pun-Off

D SPAMARAMA

20 How is "All You Need Is SPAM" organized?

F It moves from a description of the earliest events to the most recent events.

G It moves from a detailed description of a certain year to general information.

H It moves from a general introduction to specific information about the event.

J It moves from a list of questions about the event to detailed answers.

21 The most likely purpose of the selection is to —

A motivate residents of Austin to develop new slogans

B encourage people to take part in some unusual Austin events

C describe changes taking place in Austin

D invite people to live and work in Austin

22 Which sentence from "Time for a Pun-Off" best shows that the author is impressed by the skill of the participants?

F *If you love language and enjoy hearing people play with words, come to the O. Henry Pun-Off—it's definitely weird!*

G *It's amazing to hear these word masters come up with hilarious puns under pressure.*

H *A pun is a kind of joke that plays with words that sound similar but have different meanings.*

J *One year his jokes were so bad that he won a prize!*

23 Read this dictionary entry for the word pull.

pull \ˈpu̇l\ *v* **1.** to attract **2.** to exert force upon **3.** to perform or carry out **4.** to express sympathy for

What is the definition of pulls as it is used in paragraph 11?

A Definition 1

B Definition 2

C Definition 3

D Definition 4

Read the next two selections. Then answer the questions that follow them.

by John Mitchum

1 What do former president Bill Clinton and rock musician Pete Townshend have in common? Both men have hearing damage from exposure to loud music, and both now wear hearing aids as a consequence. As a teenager, Clinton played saxophone in a band. Townshend, who has the more severe hearing loss, was a guitarist for a band called the Who. He is one of the first rock musicians to call the public's attention to the problem of hearing loss from exposure to loud music.

2 Temporary hearing loss can happen after only 15 minutes of listening to loud music. One early warning sign is when your ears begin to feel warm while you listen to music at a rock concert or through headphones.

3 "What happens is the hair cells [in the inner ear] are damaged, but they're not dead," says physician and ear specialist Dr. Sam Levine. According to Dr. Levine, if you avoid further exposure to loud noise, it's possible to recondition the cells somewhat. However, he adds, "Eventually, over a long period of time, hair cells are permanently damaged." And this is no small problem.

4 When tiny hair cells in the cochlea (CO-klee-uh), a coiled tube in the inner ear, are damaged or destroyed, an abnormal sound is sometimes produced in a person's head. This sensation of a ringing in the ears is called tinnitus (tin-IH-tuss). Tinnitus can also consist of hissing, clicking, or buzzing sounds that can be heard only by the person affected with the condition.

Continued on next page

Continued from page 27

5 What sound level is dangerous? According to Dr. Levine, regular exposure to noise in excess of 85 decibels is considered dangerous. A decibel is the unit of measurement for sound. Most people don't carry around the scientific equipment that measures decibels, though. The chart on this page offers a comparison of decibel levels to certain sounds. Here's another gauge you can use. If you're at a rock concert and the music is so loud that you have to shout to make yourself heard, you're at risk for hearing loss. That's when wearing protective devices such as earplugs becomes critical.

6 The facts are pretty frightening. But are rock bands turning down the volume? Most aren't. "Rock music is supposed to be loud," says drummer Andrew Sather. "I wouldn't have it any other way. And neither would the real fans of rock."

7 Continued exposure to loud music and the failure to wear earplugs can lead to deafness, according to Dr. Levine. He states, "There's no cure for tinnitus or hearing loss. Your ears are trying to tell you something. That ringing is the scream of your hair cells dying. Each time that happens, more and more damage is done."

Approximate Decibel (dB) Levels of Common Noises

Normal conversation	50–65 dB
City traffic	70–75 dB
Food blender	88 dB
Portable CD player on volume 5 out of 10	100 dB
Jet plane flying above a person standing outside	103 dB
Rock band during a concert	110–140 dB

Giving speeches at schools was something musician David Todman never pictured himself doing. He thought his life would always be devoted to music. But hearing loss changed all that. The following is his story in his own words.

I Learned the Hard Rock Way

My notes about what I am reading

1 I always thought that hearing loss was something that affects other people—and not only other people, but much older other people.

2 I was a guitarist in a rock band for nearly nine years, and before that I attended every rock concert that came to town. If someone had suggested that I wear earplugs while playing or listening to music, I would have laughed. What was the point of listening to music if you couldn't enjoy it at full volume?

3 When I first began playing in a band, I noticed that my ears would ring after a concert and in normal conversations people's voices would sound muffled. But my hearing would return to normal in a day or two, so I didn't think there was any problem. I now know that people can lose their hearing gradually. My doctor explained that repeated exposure, week after week, causes permanent damage. I didn't realize that I had a problem until it was too late.

4 High-pitched sounds were the first ones I had trouble hearing. Different words—for example, *hill*, *fill*, and *sill*—sounded the same to me.

5 Sometimes my ears produce a low, dull sound, something between the hum of an organ and the purr of a car motor. At other times the sound is a ringing or a faint, high squealing. Still other times the sound is like the whooshing inside a seashell. The sounds can get so bad sometimes that I can't function. I become completely immobilized, often for hours at a time.

6 I'm now so concerned about the dangers of listening to loud music that I speak about the subject to students in middle schools and high schools. I tell students about a study in which researchers found that about 17 percent of middle school and high school students have some degree of hearing damage or loss and that the most significant hearing loss was detected in students who attend rock concerts frequently.

My notes about what I am reading

7 It wasn't until my hearing loss was diagnosed by my doctor that I learned how delicate people's ears are. So please take my advice: protect your ears. Don't go to loud rock concerts, or if you do go, use earplugs. It might not seem cool to wear earplugs, but let me tell you, hearing loss is definitely not cool. And, by the way, stuffing cotton in your ears won't do much good. That will reduce sound by only seven decibels.

8 Earplugs are not for wimps. Three of the four members of the band Metallica wear earplugs. If you play in a band, you'll still be able to hear yourself and the other instruments when you wear hearing-protection devices. Actually, you may hear more clearly once distracting noise is curtailed or even completely blocked out. Musicians' earplugs are comfortable and easy to insert, and they filter sound better than disposable plugs.

9 Music once meant everything to me. It was the center of my life and is still important. But preserving my hearing means more. After all, what good is great music if you can't hear it?

Photograph courtesy of © Henry Diltz/CORBIS.

Use "Now Hear This" (pp. 15–16) to answer questions 24–29.

24 In paragraph 3, the word recondition means to —

F not be seen

G fill with sound

H become larger in size

J make good again

25 What is the purpose of the chart included at the end of the article?

A To show readers that the only sounds that are dangerous come from music at rock concerts

B To warn readers against exposing themselves to the sounds on the list

C To give readers examples of the noise levels of some familiar sounds

D To inform readers that normal daily activities will cause hearing loss

26 The reader can tell that drummer Andrew Sather believes wearing earplugs is —

F unreasonable

G unsafe

H harmless

J impolite

27 Which of these sentences is a warning from the author to the reader?

A *Most people don't carry around the scientific equipment that measures decibels, though.*

B *When tiny hair cells in the cochlea (CO-klee-uh), a coiled tube in the inner ear, are damaged or destroyed, an abnormal sound is sometimes produced in a person's head.*

C *If you're at a rock concert and the music is so loud that you have to shout to make yourself heard, you're at risk for hearing loss.*

D *As a teenager, Clinton played saxophone in a band.*

28 The tone at the beginning of the article is —

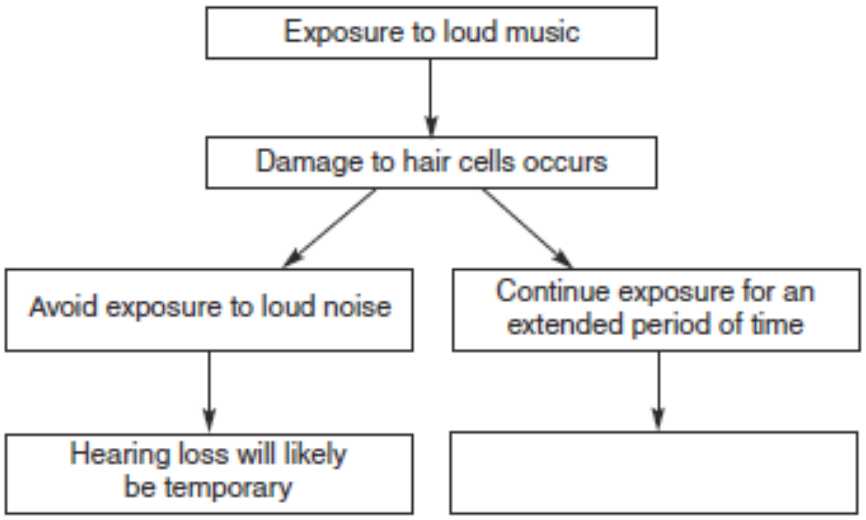
F factual

G humorous

H urgent

J hostile

29 Look at this diagram of information from the article.



Which of these belongs in the empty box?

A Must shout to have a conversation

B Permanent hearing loss

C Wear earplugs to rock concerts

D Hearing is checked by a specialist

Use "I Learned the Hard Rock Way" (pp. 17–18) to answer questions 30–34.

30 Which of these best describes how Todman feels about his youthful experiences as a musician?

F He believes that playing in a rock band helped him become a better public speaker.

G He regrets having spent so many years playing in a rock band instead of developing other skills.

H He wishes that he had known the long-term effects of listening to and playing loud rock music.

J He is disappointed that he became involved in playing rock music rather than some other type of music.

31 What was one indication that Todman might have a problem with his hearing?

A Certain words began to sound alike to him.

B He began wearing earplugs, which blocked out some sounds.

C Music at full volume became unbearable to listen to.

D He was able to hear only sounds that were at a high pitch.

32 Paragraph 5 is mainly about —

F the sounds that are the most annoying for someone who has hearing loss

G the effect of hearing so many different sounds at high decibel levels

H the fact that a person with hearing loss can hear high and low sounds

J the kinds of sounds that someone with hearing damage can experience

33 When Todman speaks to students, he wants them to —

A understand their risks of developing hearing loss

B be involved in playing in rock bands

C know that he still hopes to perform with a rock band one day

D believe that wearing earplugs is the only option they have to prevent hearing loss

34 Which word best describes Todman?

F Humorous

G Formal

H Encouraging

J Patient

Use "Now Hear This" and "I Learned the Hard Rock Way" to answer questions 35–37.

35 One difference between the article and the selection is —

A "Now Hear This" contains mostly researched facts, while "I Learned the Hard Rock Way" is written mostly from one person's experiences

B "Now Hear This" presents the information in a positive way, while "I Learned the Hard Rock Way" presents the information in a negative way

C "Now Hear This" presents a problem and a solution, while "I Learned the Hard Rock Way" presents a cause and its effects

D "Now Hear This" focuses on temporary hearing loss, while "I Learned the Hard Rock Way" focuses on permanent hearing loss

36 David Todman's opinion of drummer Andrew Sather would most likely be that Sather is —

F foolish

G inspiring

H unpopular

J clever

37 What would the author of "I Learned the Hard Rock Way" most likely think of the article "Now Hear This"?

A That the article blames rock musicians for causing people to develop hearing loss

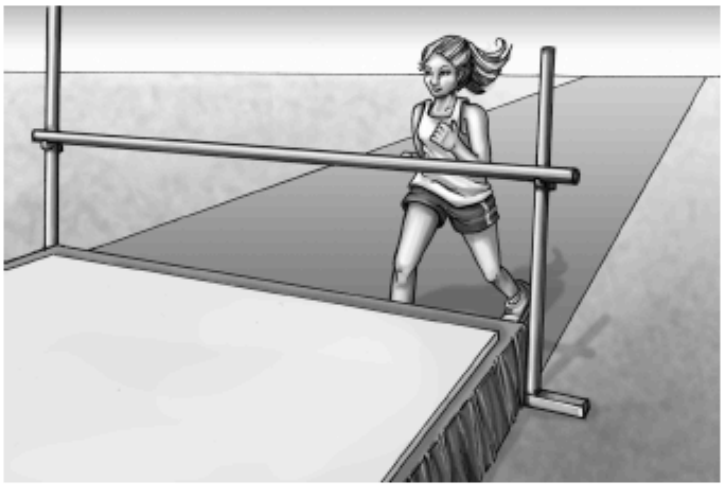
B That the article is trying to calm the general public by quoting a doctor

C That the article includes a great deal of unnecessary technical information

D That the article provides valuable information to the public as well as to musicians

Read this selection. Then answer the questions that follow it.

The Hard Truth



My notes about what I am reading

1 The track was almost deserted. Only Marissa and one other kid were still practicing. Marissa studied the high-jump bar and reminded herself about the techniques she had been practicing for weeks. She shook her hands, trying to loosen up. Then she ran the short distance, planted her foot in front of the bar, and jumped. But instead of flying gracefully over the bar, she knocked it down, and both Marissa and the bar landed on the mat with a thump. She lay there for a moment, thinking about the mess she had gotten herself into.

2 Marissa's mother had been a track star in school. The school trophy case was full of trophies and medals with her mother's name on them. A few weeks ago Marissa had had the idea to sign up for track. She thought it would make her mother happy. But now she realized that no matter how hard she worked, she would never be a track star like her mother.

3 As Marissa got up from the mat, she noticed a spiderweb between one of the vertical poles and the ground. It glistened in the sunlight. A spider was weaving a little pattern. It wasn't trying to be something else, like a butterfly or a grasshopper, Marissa thought. It was content to be exactly what it was and to do what it was good

My notes about what I am reading

at—spinning webs. It even worked out in the open so everyone could see it. The spider did what came naturally to it.

4 What came naturally to Marissa was art. She could paint, draw, or sketch all day long and never get tired or bored. But Marissa didn't want to hurt her mother, who had taken pictures of Marissa in her track uniform and sent them to all the relatives. Her mother had even written a caption underneath that read "Second-Generation Track Star." But the first track meet was coming up in a few weeks, and Marissa knew her mother would be completely mortified when she saw how terribly Marissa would perform. She had to find a way out of this mess without embarrassing her mother.

5 Later that night at the dinner table, Marissa pushed her peas around until they formed a circle on her plate. Her mother was washing dishes at the sink and noticed what Marissa had done. "You've got track on the brain. You're even turning dinner into your new favorite thing! What does Coach Evans think about your jumps?" her mother asked.

6 Marissa shrugged and smiled halfheartedly. Who was she kidding? Why had she thought that just because her mother had been good at the high jump, she would be, too?

7 It was the perfect time to tell her mother how she felt about track, but . . . "He says to keep working hard" was all Marissa could manage before she headed upstairs to do homework.

8 In her bedroom Marissa stared out the window. Then she turned to the stack of homework in front of her. There was so much. Before she had signed up for track, she would come home from school, do her homework, have dinner with the family, and then have time for her art. Now she got home late, ate dinner alone, and started her homework. There was no time for anything else.

9 Halfway through her homework, Marissa fell asleep. When she woke up from a troubled dream, the clock read 1:00 A.M. Marissa panicked. There was still so much homework to do, but she really needed her rest for track practice in the morning. Marissa had always been a good student, but now track was threatening her grades.

10 Then a dark thought crossed Marissa's mind like a cloud covering the moon. If she failed some of her classes,

My notes about what I am reading

she would be off the track team. That was one way to solve her problem.

11 The next day at school, Marissa was missing two assignments. During math, she couldn't follow the lesson because she hadn't done her homework. She failed the quiz and earned a surprised scowl from her teacher.

12 After a week of deliberately ignoring her homework, Marissa had a stomach full of knots. Letters had been mailed out to parents listing grades, and Marissa knew her letter would show that her grades had dropped drastically. She trudged home, knowing her ugly plan of neglect had worked.

13 Just as Marissa had suspected, her mother was waiting on the front porch with the letter in her hand. She held it up to Marissa. "What's happening to your grades?" she asked, thrusting the letter toward her daughter. "And more importantly, what's happening to you?"

14 At that moment Marissa knew what she had to do. On the verge of tears, she admitted her secret. "I only joined the track team to make you proud of me. I hated it, but I didn't want to disappoint you. I thought if I was failing in my classes, Coach would kick me off the team. What a mess I've made of everything."

15 Marissa watched her mother's face turn from anger to concern. "Marissa, I was always proud of you. You are a wonderful artist, a good student, and a great daughter. You didn't need to do the high jump to make me happy." Her mother paused and then looked at Marissa seriously before she continued. "The next time you have a problem, you need to let me know. We can talk about this later. But for now you have a lot of hard work in front of you because you made a bad choice."

16 Marissa knew it would not be easy to repair the damage she had done, but she felt the knots untying in her stomach. She thought again about the little spider and how it was so focused on spinning its web. She realized that she had lost sight of her purpose and tangled up her web. Now she had to go back and rebuild that web.

38 In paragraph 6, the author uses the word halfheartedly to show that Marissa smiles with —

F complete boredom

G tremendous patience

H much eagerness

J little enthusiasm

39 The reader can conclude that Marissa's mother —

A believes that Marissa is not trying hard enough

B wants Marissa to pursue her own interests

C suspects that Marissa does not like her schoolwork

D puts pressure on Marissa to be a successful athlete

40 Paragraph 8 is mostly about —

F what time Marissa gets home from school

G how Marissa's life has recently changed

H whom Marissa eats dinner with

J how much homework Marissa has to do

41 Which of the following is the best summary of the selection?

A Marissa joins the track team although she would really prefer to focus on art. Her mother believes Marissa enjoys track and jokes about it with her. Because track practice takes a lot of time, Marissa's grades fall. Finally Marissa admits that she dislikes track.

B Marissa's mother was very good at track when she attended school. Marissa sees trophies and medals that her mother won in the trophy case at school. Marissa wants to be as good at track as her mother, so she trains hard. Marissa discovers that she is not good at track.

C Marissa signs up for track to please her mother, a former track star. Marissa is better at art than track but fears disappointing her mother. So she stops doing her homework, hoping that she will be taken off the team. After her grades worsen, Marissa confesses to her mother and realizes what she needs to do.

D Marissa joins the track team, and her grades begin to fall. The school sends a letter home, and Marissa discusses her grades with her mother. Marissa's mother tells Marissa to come talk to her the next time she has a problem. Marissa's mother tells Marissa that she is a wonderful artist and a good student.

42 Why does Marissa eat dinner alone each night?

F She stays after school to get help on her assignments.

G She has more homework now than she did before.

H She has changed her usual routine.

J She is being punished for her poor grades.

43 Which sentence from the selection best shows that Marissa feels she must succeed at track?

A *Her mother had even written a caption underneath that read "Second-Generation Track Star."*

B *But now she realized that no matter how hard she worked, she would never be a track star like her mother.*

C *"He says to keep working hard" was all Marissa could manage before she headed upstairs to do homework.*

D *Marissa watched her mother's face turn from anger to concern.*

44 Seeing what happens from Marissa's viewpoint helps the reader understand the —

F motives of other characters

G events that will occur later in the story

H main character's inner thoughts

J multiple problems in the story

45 Why is paragraph 13 important to the selection?

A Marissa's mother discovers that Marissa has a problem.

B The setting is described.

C Marissa's mother is described as a strong character.

D The flashback ends.

46 Which words from paragraph 12 does the author use to create a mood of despair?

F *mailed out to parents*

G *ugly plan of neglect*

H *letter would show*

J *listing grades*

47 What is Marissa's main problem in the selection?

A She cannot find her true talent.

B Her mother pushes her to join the track team.

C She joins the track team, but she would rather do something else.

D Her grades are important, but she needs more time on the track.

48 Read this sentence from paragraph 10 of the selection.

> *Then a dark thought crossed Marissa's mind like a cloud covering the moon.*

The author uses this simile to show —

F why Marissa has fallen asleep

G Marissa's feelings about her mother

H how the evening sky looks to Marissa

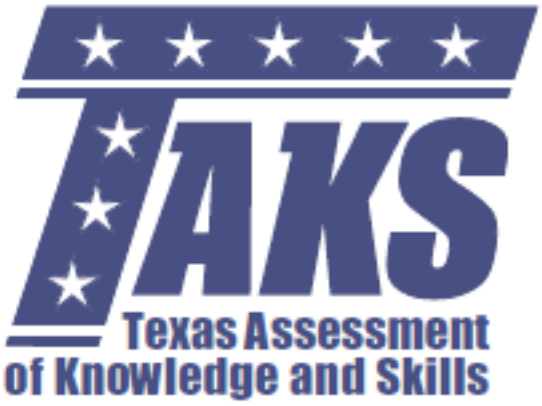
J the beginning of Marissa's plan

Texas Assessment of Knowledge and Skills - Answer Key

Grade: 07
Subject: Reading
Administration: April 2009

Item Number	Correct Answer	Objective Measured	Student Expectations
01	B	01	7.10 (F)
02	J	04	7.11 (D)
03	C	01	7.10 (F)
04	J	04	7.12 (I)
05	A	03	7.10 (L)
06	G	04	7.12 (K)
07	A	02	7.12 (F)
08	H	03	7.10 (E)
09	C	02	7.12 (G)
10	G	02	7.12 (J)
11	D	03	7.10 (E)
12	J	04	7.10 (H)
13	A	02	7.12 (J)
14	H	04	7.10 (J)
15	A	02	7.12 (J)
16	G	01	7.9 (B)
17	D	03	7.10 (E)
18	F	01	7.10 (G)
19	B	01	7.10 (F)
20	H	04	7.12 (I)
21	B	03	7.12 (A)
22	G	04	7.11 (C)
23	A	01	7.9 (B)
24	J	01	7.9 (D)
25	C	03	7.12 (A)
26	F	04	7.10 (H)
27	C	04	7.11 (C)
28	F	04	7.12 (K)
29	B	03	7.10 (L)
30	H	02	7.12 (F)
31	A	01	7.10 (F)
32	J	01	7.10 (F)
33	A	04	7.10 (H)
34	H	02	7.12 (F)
35	A	03	7.10 (I)
36	F	04	7.11 (D)
37	D	04	7.10 (H)
38	J	01	7.9 (F)
39	B	04	7.10 (H)
40	G	01	7.10 (F)
41	C	01	7.10 (G)
42	H	03	7.10 (E)
43	A	04	7.11 (C)
44	H	03	7.12 (H)
45	A	02	7.12 (G)
46	G	04	7.12 (K)
47	C	02	7.12 (F)
48	J	02	7.12 (J)

STUDENT NAME _____



GRADE 7
MATHEMATICS

Mathematics Chart

LENGTH

Metric	Customary
1 kilometer = 1000 meters	1 mile = 1760 yards
1 meter = 100 centimeters	1 mile = 5280 feet
1 centimeter = 10 millimeters	1 yard = 3 feet
	1 foot = 12 inches

CAPACITY AND VOLUME

Metric	Customary
1 liter = 1000 milliliters	1 gallon = 4 quarts
	1 gallon = 128 fluid ounces
	1 quart = 2 pints
	1 pint = 2 cups
	1 cup = 8 fluid ounces

MASS AND WEIGHT

Metric	Customary
1 kilogram = 1000 grams	1 ton = 2000 pounds
1 gram = 1000 milligrams	1 pound = 16 ounces

TIME

1 year = 365 days

1 year = 12 months

1 year = 52 weeks

1 week = 7 days

1 day = 24 hours

1 hour = 60 minutes

1 minute = 60 seconds

Mathematics Chart

Perimeter	square	$P = 4s$
	rectangle	$P = 2l + 2w$ or $P = 2(l + w)$
Circumference	circle	$C = 2\pi r$ or $C = \pi d$
Area	square	$A = s^2$
	rectangle	$A = lw$ or $A = bh$
	triangle	$A = \frac{1}{2}bh$ or $A = \frac{bh}{2}$
	trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$ or $A = \frac{(b_1 + b_2)h}{2}$
	circle	$A = \pi r^2$
B represents the Area of the Base of a three-dimensional figure.		
Volume	cube	$V = s^3$
	rectangular prism	$V = lwh$ or $V = Bh$
	triangular prism	$V = Bh$
	cylinder	$V = \pi r^2 h$ or $V = Bh$
Pi	π	$\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$

DIRECTIONS

Read each question. Then fill in the correct answer on your answer document. If a correct answer is not here, mark the letter for "Not here."

SAMPLE A

Find the greatest common factor of 12 and 18.

A 3

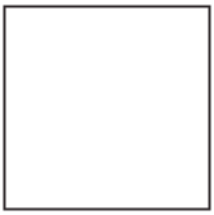
B 6

C 9

D Not here

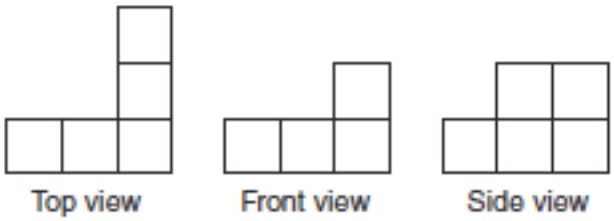
SAMPLE B

Find the perimeter of this square rug in meters.



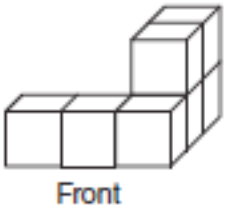
Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

1 The top, front, and side views of a 3-dimensional figure built with identical cubes are shown below.

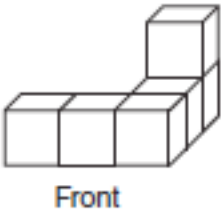


Which 3-dimensional figure do these views best represent?

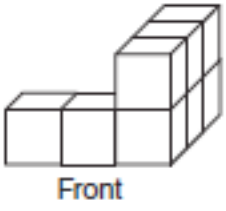
A



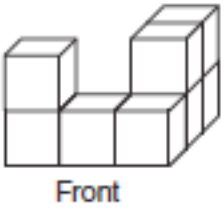
C



B



D



2 Mike got a 45% discount when he bought a new jacket. Which of the following is NOT equivalent to 45%?

F $\frac{9}{20}$

G $\frac{4}{5}$

H 0.45

J $\frac{45}{100}$

3 Three students compared the number of hours they each studied for a test.

- The number of hours that Mary studied was 2 less than the number of hours that Jackie studied.
- The number of hours that Jackie studied was 4 more than the number of hours that Veronica studied.
- Veronica studied 3 hours.

Based on this information, which statement is true?

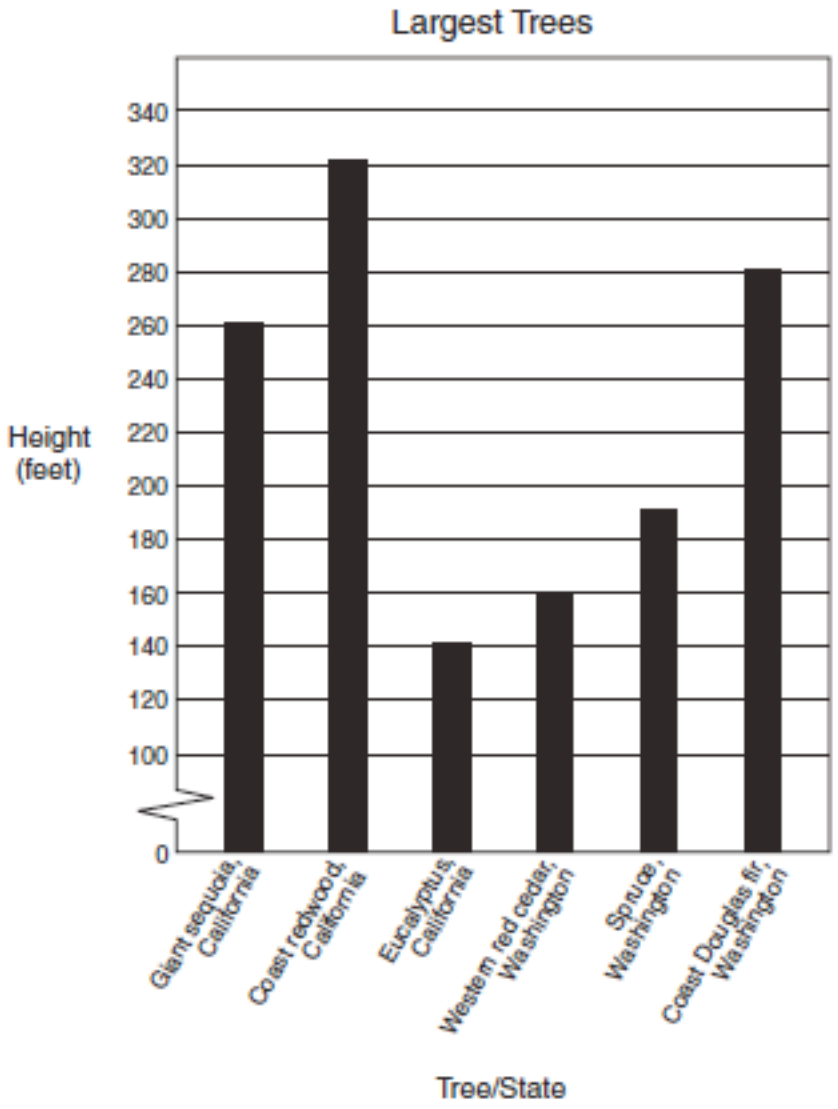
A Jackie studied 1 hour, because $4 - 3 = 1$.

B Mary studied 5 hours, because $3 + 4 = 7$ and $7 - 2 = 5$.

C Veronica studied 2 hours more than Mary, because $4 - 2 = 2$.

D Jackie, Mary, and Veronica studied a total of 9 hours, because $2 + 4 + 3 = 9$.

4 The graph below shows the height of 6 of the largest trees found in the United States.



Which statement is best supported by the graph?

F The 3 shortest trees shown are from Washington.

G The tallest tree and the shortest tree shown are from Washington.

H The height of the coast redwood tree is three times the height of the spruce tree.

J The height of the eucalyptus tree is about half the height of the coast Douglas fir tree.

5 Ming has a plastic container that is shaped like a rectangular prism. The container has a length of 14 centimeters and a width of 6 centimeters. If the volume of the container is 840 cubic centimeters, what is its height?

A 10 cm

B 42 cm

C 14 cm

D 168 cm

6 The table below shows the number of minutes Steve used his cell phone each month during a 4-month period.

Steve's Cell Phone

Month	Number of Minutes
January	306
February	302
March	302
April	305

Steve pays a monthly fee of $40 for a 300-minute plan plus $0.40 for each minute over 300. What was the total amount Steve paid for these 4 months, not including tax?

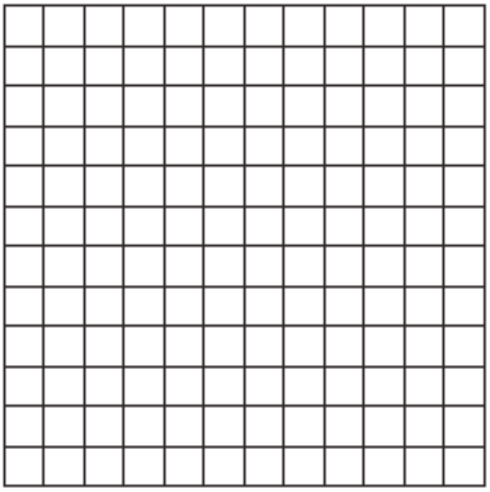
F $220

G $166

H $126

J $154

7 The model below is a square with an area of 144 square units.



Which of these equations can be used to determine s, the side length of this model in units?

A $s = \sqrt{144}$

B $s = 12^{12}$

C $s = 144$

D $s = \sqrt{24}$

8 Karen is k years old. Raul's age, r, is 6 more than 2 times Karen's age. Which of the following equations best represents this situation?

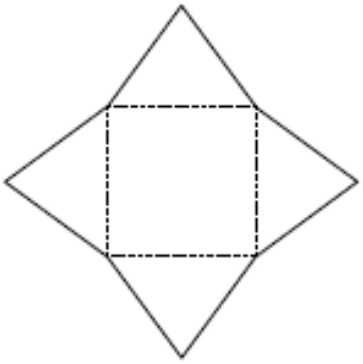
F $r = (6 + 2)k$

G $k = 2r + 6$

H $r = 2k + 6$

J $k = (6 + 2)r$

9 Lily folded the net below along the dashed line segments.



Which of the following best describes the shape of the folded object?

A Square prism

B Square pyramid

C Triangular prism

D Triangular pyramid

10 Samantha is using a wooden strip $\frac{7}{8}$ yard long to make a picture frame. If she cuts off a piece that is $\frac{3}{4}$ yard long, which fraction best represents the portion that is left of the original strip?

F $\frac{13}{8}$ yd

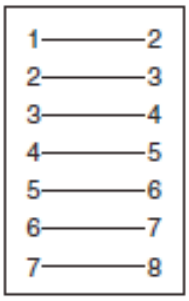
G 1 yd

H $\frac{1}{4}$ yd

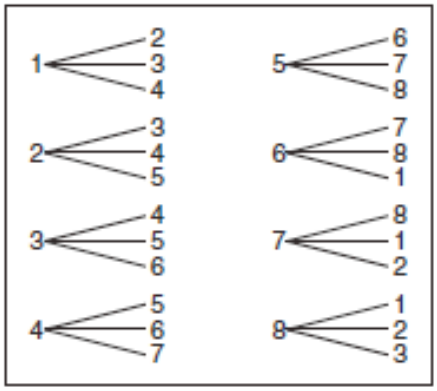
J $\frac{1}{8}$ yd

11 There are 8 girls in a dance class. The girls are represented in the diagrams below by the numbers 1 through 8. If each girl needs a dance partner, which list shows all the possible combinations of girls in the dance class?

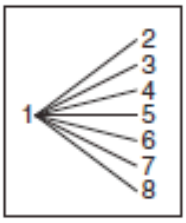
A



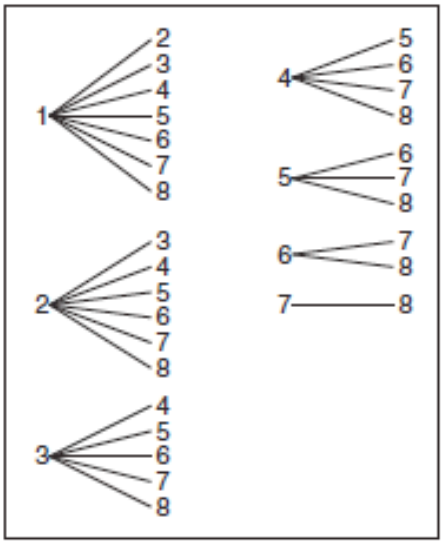
B



C



D



12 Ernest bought one of each of the following food items at the grocery store.

Ernest's Groceries

Item	Price
Milk	$2.00
Chips	$2.50
Bread	$0.80
Cheese	$3.50
Ham	$5.50

If Ernest was charged $16.80, for which item did the cashier accidentally charge him twice?

F Milk

G Bread

H Chips

J Cheese

13 Which list of integers is in order from least to greatest?

A $-42, -39, -4, 40, 41$

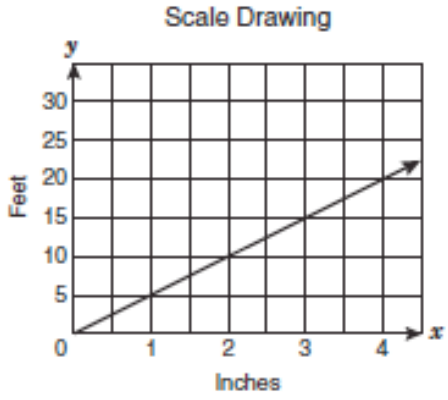
B $-42, 41, 40, -39, -4$

C $-4, -39, 40, 41, -42$

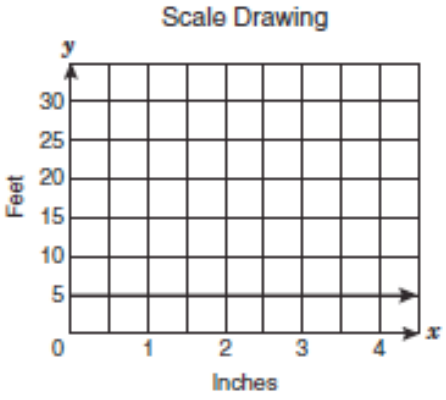
D $41, 40, -4, -39, -42$

14 Oscar made a scale drawing of his backyard. In his drawing, $\frac{1}{2}$ inch represents 5 feet. Which graph best represents this relationship?

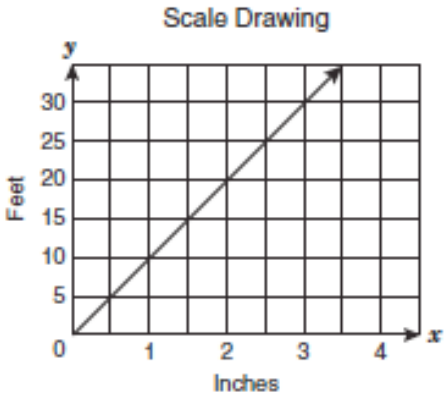
F



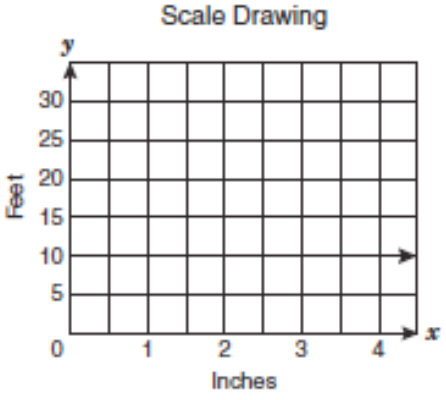
H



G



J



15 Marilyn was studying the effects of tripling the dimensions of 4 rectangles. The table below shows these effects.

Area of Rectangles

Original Area (square centimeters)	New Area (square centimeters)
4	36
36	324
324	2,916
2,916	26,244

Based on the information in the table, which statement is true?

A Tripling the dimensions of any rectangle increases its area by a factor of 12.

B Tripling the dimensions of any rectangle increases its area by a factor of 3.

C Tripling the dimensions of any rectangle increases its area by a factor of 6.

D Tripling the dimensions of any rectangle increases its area by a factor of 9.

16 Laura looked at several different flower arrangements before purchasing one. The arrangements varied in price from \$15.62 to \$37.50. Which measure of data can be used to describe the variation in price of the different arrangements?

F Mean

G Mode

H Range

J Median

17 Which rule can be used to find the value of the nth term in the sequence below, where n represents the position of the term?

Position	Value of Term
1	$\frac{3}{4}$
2	$1\frac{1}{2}$
3	$2\frac{1}{4}$
4	3
5	$3\frac{3}{4}$
n	

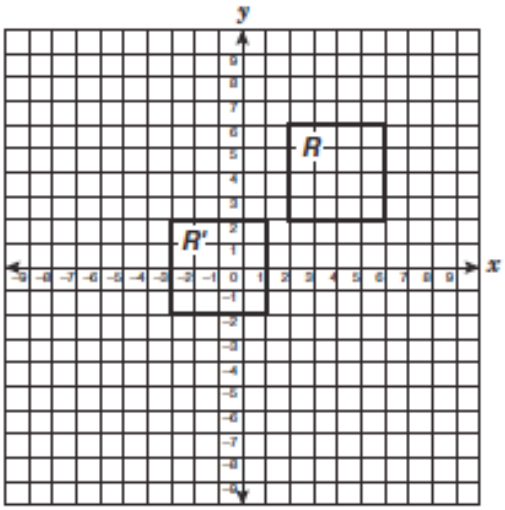
A $\frac{n+2}{4}$

B $\frac{n+1}{2}$

C $\frac{2n+5}{4}$

D $\frac{3n}{4}$

18 The vertices of square R were translated to form the vertices of square R'.



Which of the following best describes the translation?

F 4 units left and 5 units down

G 5 units left and 4 units down

H 5 units right and 4 units up

J 4 units right and 5 units up

19 Gina purchased 3 paintbrushes for $18.87, not including tax. If each paintbrush cost the same amount, what was the cost in dollars and cents for each paintbrush, not including tax?

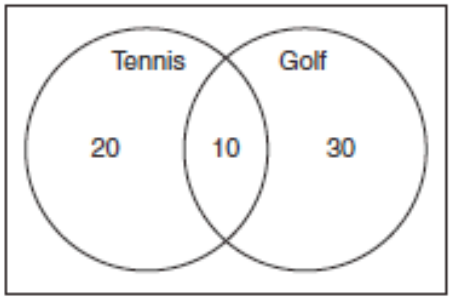
Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

20 A coach conducted a survey to determine how many students plan to try out for tennis and golf. The results of the survey are shown below.

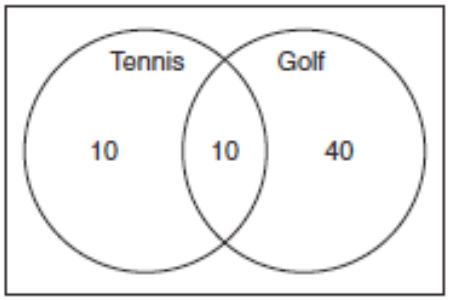
- A total of 20 students plan to try out for tennis.
- A total of 40 students plan to try out for golf.
- 10 students plan to try out for both tennis and golf.

Which Venn diagram best represents this information?

F



H



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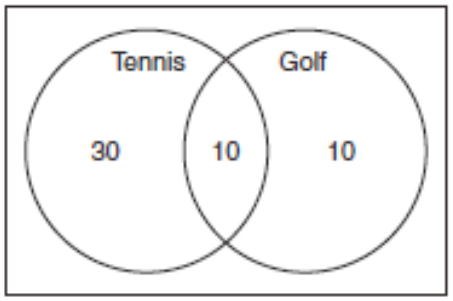

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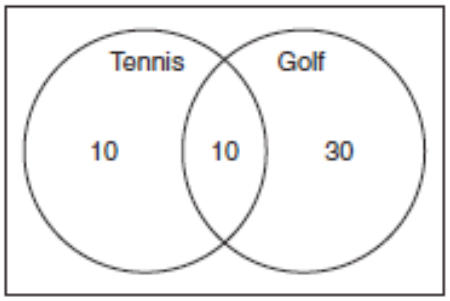


21 It takes 90 minutes to wash 20 vehicles at a car wash. At this rate, how many minutes does it take to wash 5 vehicles?

A 22 min

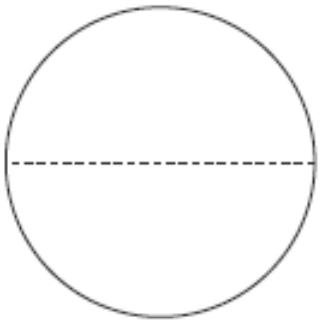
B 14 min

C $22\frac{1}{2}$ min

D $7\frac{1}{2}$ min

22 Jared designed buttons for his student-council campaign. The figure below shows the size of each campaign button. Use the ruler on the Mathematics Chart to measure the diameter of the button to the nearest quarter of an inch.

Jared's Campaign Button



Which is closest to the circumference of the button that Jared designed?

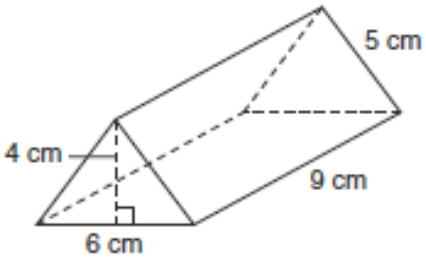
F 15.7 in.

G 6.28 in.

H 7.8 in.

J 3.14 in.

23 A company developed a box in the shape of a triangular prism, as shown below.



A formula for the volume of a triangular prism is $V = Bh$. Which expression can be used to find B, the area of the base of this prism in square centimeters?

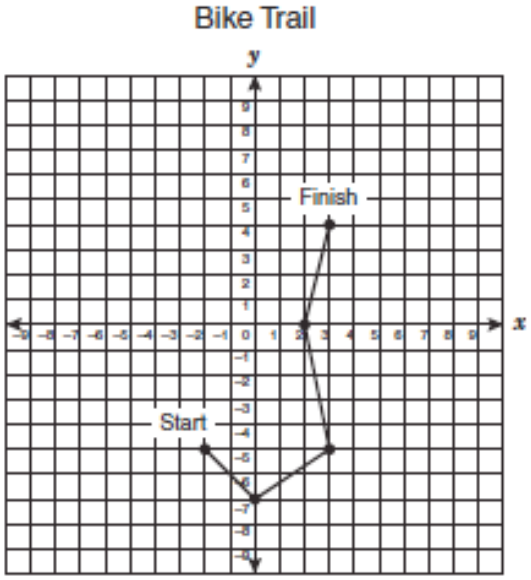
A $\frac{(6)(5)}{2}$

B $(6)(4)(9)$

C $\frac{(6)(4)}{2}$

D $(6)(5)(9)$

24 The grid below shows the path of a bike trail.



Which of the following best represents a point that lies on the bike trail?

F $(2, -5)$

G $(-5, -3)$

H $(4, 3)$

J $(2, 0)$

25 Which of the following can be used to find y, the number of yards in 4 miles?

A $y = \frac{1,760}{4}$

B $y = 4 \cdot 1,760$

C $y = 4 \cdot 5,280$

D $y = \frac{5,280}{4}$

26 What is the value of the expression below?

$$5 + 5(9 \div 3)^2$$

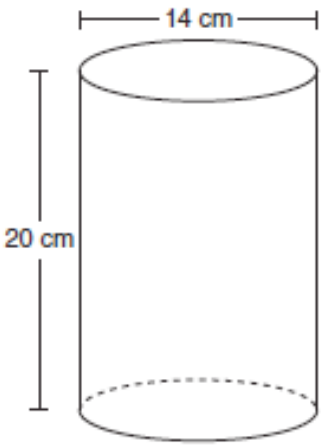
F 35

G 90

H 50

J 230

27 Justin uses a container in the shape of a cylinder to store his markers. The diagram below shows the dimensions of the container.



Which of the following is closest to the volume of the container?

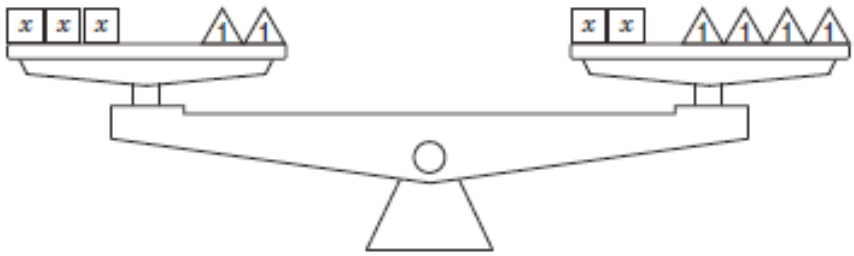
A 3,077 cm^3

B 1,758 cm^3

C 879 cm^3

D 440 cm^3

28 The model below represents the equation $3x + 2 = 2x + 4$.



What is the value of x?

F $x = 5$

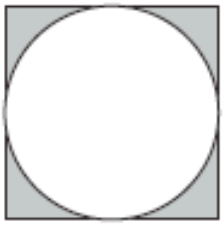
G $x = 1$

H $x = 6$

J $x = 2$

---

29 Jeff drew a circle inside a square, as shown below.



Which method can Jeff use to find the area of the square not covered by the circle?

A Subtract the area of the circle from the area of the square

B Subtract the area of the square from the area of the circle

C Subtract $\frac{1}{4}$ the area of the square from the area of the circle

D Subtract $\frac{1}{4}$ the area of the circle from the area of the square

30 Melissa bought lunch for herself and 2 friends. The cost for each lunch was between \$3.95 and \$4.80, including tax. Which of the following could be the total cost of the lunches that Melissa bought?

F \$9

G \$13

H \$18

J \$26

31 A soccer league has 64 teams competing in a tournament. In each round, pairs of teams compete. The team that wins advances to the next round. The table below shows the results of the first 2 rounds.

Soccer League Tournament

Round	Number of Teams Competing	Number of Teams Remaining
1	64	32
2	32	16

At the end of which round will there be only 2 teams remaining, assuming there are no ties?

A Round 4

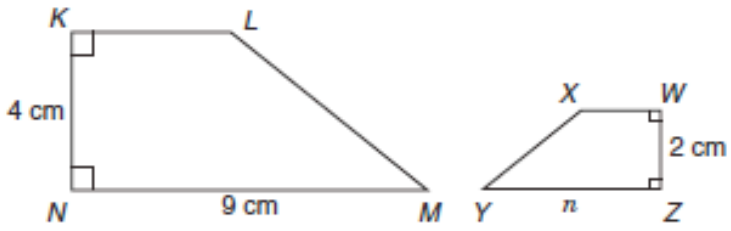
B Round 5

C Round 6

D Round 7

---

32 In the diagram below, figure *KLMN* is similar to figure *WXYZ*.



Which of the following proportions can be used to find the value of n?

F $\frac{4}{n} = \frac{2}{9}$

G $\frac{2}{n} = \frac{9}{4}$

H $\frac{13}{n} = \frac{2}{4}$

J $\frac{4}{2} = \frac{9}{n}$

33 Jake spent a total of $20 on the items below.

- 2 movie tickets for $6 each
- 1 bag of popcorn for $3.50
- 2 drinks for $2.25 each

What percent of the $20 did Jake spend on movie tickets?

A 40%

B 12%

C 60%

D 8%

34 Zariah's bicycle wheel can travel about 6.5 feet per revolution. Which statement is best supported by this information?

F The wheel can travel about 120.5 feet in 60 revolutions.

G The wheel can travel about 33.5 feet in 40 revolutions.

H The wheel can travel about 30.5 feet in 6 revolutions.

J The wheel can travel about 97.5 feet in 15 revolutions.

35 Mr. Ochoa is ordering a meal with 3 side dishes at a restaurant. The side dishes he can choose from are shown below.

Peas

Carrots

Rice

Beans

Which list shows all the possible outcomes when 3 different side dishes are selected?

A Peas, Carrots, Rice
Peas, Carrots, Beans
Peas, Rice, Beans
Carrots, Rice, Beans

B Peas, Carrots, Rice
Peas, Carrots, Beans
Peas, Rice, Peas
Peas, Rice, Beans

C Peas, Carrots, Rice
Peas, Carrots, Beans
Carrots, Rice, Beans

D Peas, Carrots, Rice
Carrots, Rice, Beans
Rice, Beans, Peas
Beans, Rice, Beans

36 The price of gasoline at 4 different gas stations is shown in the table below.

Gasoline Prices

Gas Station	Amount of Gasoline (gallons)	Price
K	15	$36.00
L	10	$23.50
M	8	$20.00
N	20	$51.00

Which gas station charges the least amount per gallon of gasoline?

F Gas Station K

G Gas Station L

H Gas Station M

J Gas Station N

---

37 Lois drew an angle that measures 65°. What is the measure of an angle that is supplementary to the 65° angle?

A 25°

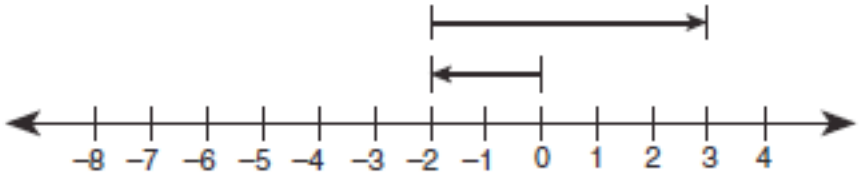
B 105°

C 115°

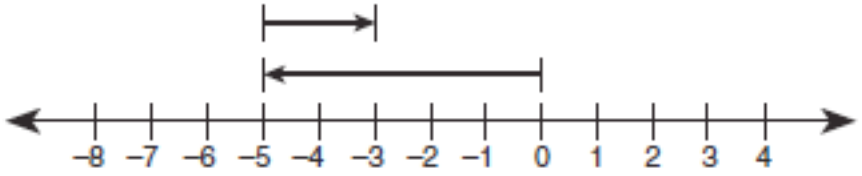
D 35°

38 Which model represents $-5 + 2$?

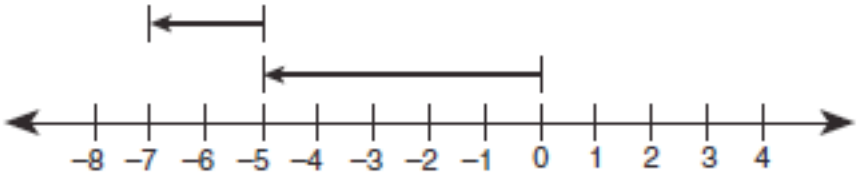
F



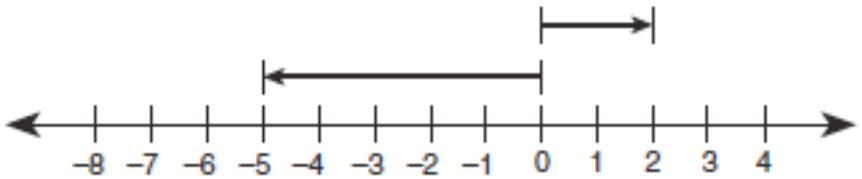
G



H



J



39 Mr. Ellis was trying to find a tablecloth for his rectangular dining table. He knew the area and perimeter of the tabletop.

Area = 36 square feet

Perimeter = 26 feet

Which best represents the width and length of the tabletop?

A Width = 2 ft
Length = 18 ft

B Width = 3 ft
Length = 12 ft

C Width = 6 ft
Length = 6 ft

D Width = 4 ft
Length = 9 ft

40 Neal was working on a crossword puzzle and needed to find a state that began with the letter *M*. The states he had to choose from and the number of letters in each state's name are shown below.

States That Begin with the Letter *M*

State	Number of Letters
Maine	5
Maryland	8
Massachusetts	13
Michigan	8
Minnesota	9
Montana	7
Mississippi	11
Missouri	8

Neal found the mean, median, mode, and range of the number of letters in each state's name. Which one of these measures is NOT equal to 8?

F Mean

G Median

H Mode

J Range

41 Which table below shows the sequence that follows the rule $8n - 2$, where n represents the position of a term in the sequence?

A

Position	1	2	3	4	5	n
Value of Term	7	8	9	10	11	

B

Position	1	2	3	4	5	n
Value of Term	6	14	22	30	38	

C

Position	1	2	3	4	5	n
Value of Term	6	4	2	0	–2	

D

Position	1	2	3	4	5	n
Value of Term	7	15	23	31	39	

---

42 A box contains 14 candy bars of equal weight. The weight of the empty box is 10 ounces, and the total weight of the box and the candy bars is 80 ounces. Which method can be used to find the weight in ounces of each candy bar?

F Subtract 10 from 80 and then multiply the difference by 14

G Subtract 10 from 80 and then divide the difference by 14

H Subtract 14 from 80 and then multiply the difference by 10

J Subtract 14 from 80 and then divide the difference by 10

43 Alex practices playing the piano for $2\frac{1}{2}$ hours each week. If Alex practiced for a total of 35 hours, which expression could be used to determine the number of weeks he practiced?

A $35 \div \frac{5}{2}$

B $35 - \frac{5}{2}$

C $35 \times \frac{5}{2}$

D $35 + \frac{5}{2}$

44 A computer-lab assistant recorded the number of students that used the lab each day for 4 days. The table below shows the results.

Computer Lab

Day	Number of Students
Monday	36
Tuesday	72
Wednesday	60
Thursday	32

Which statement is best supported by the data in the table?

F The number of students who used the lab on Wednesday and Thursday combined was more than half the total number of students who used the lab.

G There were more students who used the lab on Wednesday than students who used the lab on Monday and Thursday combined.

H The number of students who used the lab on Tuesday was twice the number of students who used the lab on Monday.

J There were fewer students who used the lab on Tuesday than students who used the lab on Monday and Thursday combined.

45 Mario answered 75% of the 40 problems on his history homework correctly. How many problems on his homework did he answer correctly?

A 19

B 30

C 28

D 10

46 In a factory, one machine makes flashlights at a rate of 150 flashlights per hour, and another machine makes the same flashlights at a rate of 135 flashlights per hour. Which of the following equations can be used to find t, the total number of flashlights both machines will make in 8 hours?

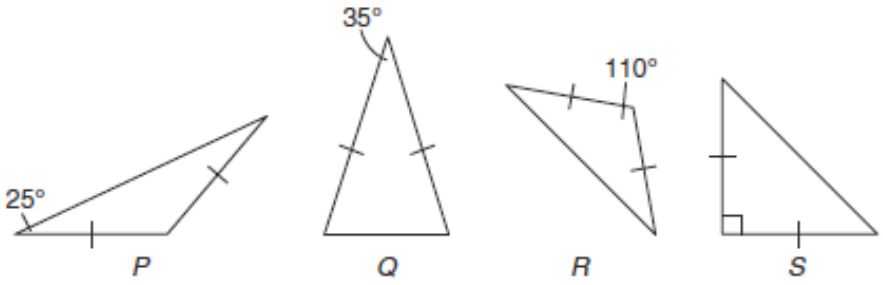
F $t = (150 + 135) \div 8$

G $t = 150(8) - 135(8)$

H $t = (150 + 135)8$

J $t = 150(8) + 135$

47 Which of the following are obtuse isosceles triangles?



A P and R only

B Q and R only

C P, Q, and R only

D P, R, and S only

---

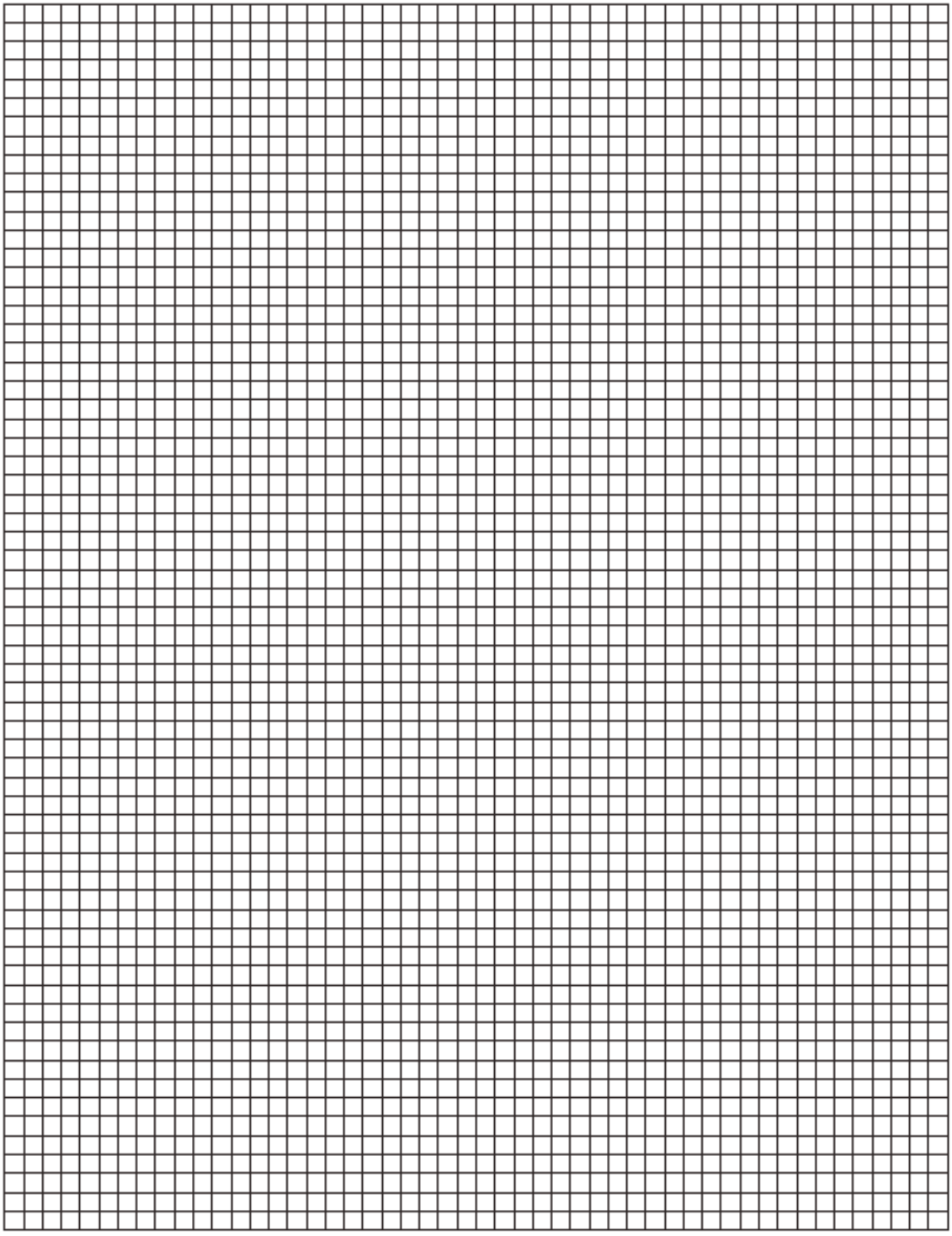
48 A dance instructor charges each student \$57 for dance lessons. Students who register early receive a \$15 discount. A total of 11 students took dance lessons. If 5 of these students registered early, how much should the instructor collect from these 11 students?

F \$462

G \$552

H \$342

J \$537

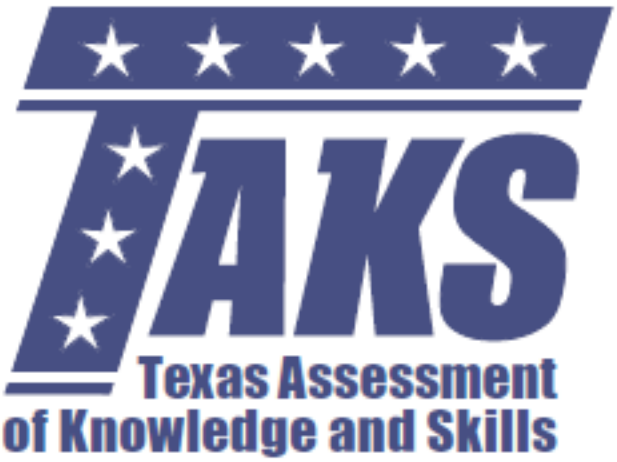


Texas Assessment of Knowledge and Skills - Answer Key

Grade: 07
Subject: Mathematics
Administration: April 2009

Item Number	Correct Answer	Objective Measured	Student Expectations
01	A	03	7.8 (A)
02	G	01	7.1 (B)
03	B	06	7.15 (B)
04	J	05	7.11 (B)
05	A	04	7.9 (C)
06	G	06	7.13 (B)
07	A	01	7.1 (C)
08	H	02	7.5 (B)
09	B	03	7.8 (B)
10	J	01	7.2 (B)
11	D	05	7.10 (A)
12	H	06	7.13 (A)
13	A	01	7.1 (A)
14	G	02	7.4 (B)
15	D	06	7.15 (A)
16	H	05	7.12 (B)
17	D	02	7.4 (C)
18	G	03	7.7 (B)
19	6.29	01	7.2 (D)
20	J	05	7.11 (A)
21	C	02	7.3 (B)
22	G	04	7.9 (A)
23	C	04	7.9 (B)
24	J	03	7.7 (A)
25	B	02	7.4 (A)
26	H	01	7.2 (E)
27	A	04	7.9 (C)
28	J	02	7.5 (A)
29	A	06	7.14 (A)
30	G	01	7.2 (G)
31	B	06	7.13 (C)
32	J	03	7.6 (D)
33	C	02	7.3 (A)
34	J	06	7.13 (A)
35	A	05	7.10 (A)
36	G	02	7.3 (B)
37	C	03	7.6 (A)
38	G	01	7.2 (C)
39	D	04	7.9 (A)
40	F	05	7.12 (A)
41	B	02	7.4 (C)
42	G	06	7.14 (A)
43	A	01	7.2 (A)
44	H	05	7.11 (B)
45	B	02	7.3 (A)
46	H	01	7.2 (F)
47	A	03	7.6 (B)
48	G	06	7.13 (B)

STUDENT NAME _____



GRADE 8
READING

Read this selection. Then answer the questions that follow it.

What to Worry About

My notes about what I am reading

1 I make the two-hour drive to visit my *zayde*, or grandfather, every Sunday afternoon. Since my childhood I have trusted him more than any other person. And despite the fact that I'm now in college, this has not changed. He is a rock in my life and always has been. It is because of Zayde Bobrov that I know what to worry about and what not to worry about in my life.

2 In 1946 Zayde emigrated from Kiev, Ukraine, which was then part of the Soviet Union. He was just a teenager. He told me that the voyage across the ocean made him sick, not from the crowded ship's motion, but from the smells and rotten food. Once he arrived at Ellis Island, he still had many more tribulations to overcome. He knew the United States had more to offer than the Soviet Union, which was recovering from World War II, but he missed his homeland and his family. New York City proved frightening for Zayde, especially since he was trying to learn a new language and find work. I can hardly imagine the struggles Zayde must have gone through, since I have always had everything I need.

3 I remember a specific day with Zayde when I was eight years old. We were sitting on the porch swing at my parents' house, gently moving back and forth. In his thick Russian accent, Zayde was telling me about his first few months in New York.

4 "I was still learning English then," Zayde said. "I was sitting on a busy street corner with no food and no money to buy food. I was watching people walk to their jobs and into restaurants. And I was angry. I was angry that I had sailed across the ocean for a job and couldn't get one. I was angry that I had no food because I had no job. I was angry that these people walking down the streets had things that I didn't have. I sat on that corner for almost a week, just being angry. But then I realized that I shouldn't be worrying about those people or be angry with them. All that worry and anger had made me lose focus on what I needed to do for myself. And since that day, Anna, my worries have been only about what I need to do to make my life better."

My notes about what I am reading

5 Of course, being only eight years old at the time, I didn't truly grasp what Zayde was trying to tell me. I did know that he had eventually found a job, married my grandmother, and had a family. I knew that he had worked hard to support his family. He wanted to make sure his children would get the best education possible and not have to struggle the way he had. But it wasn't until I was 13 that I began to realize what Zayde was saying, despite the fact that I had heard his story a dozen times by then.

6 My older sister Helen was a tough act to follow. She had a beautiful singing voice, was the star of the school basketball team, and was popular with all the kids in our school. She was everything that I wanted to be when I was 13. But I couldn't sing to save my life. Sports caused more physical harm to me, and those around me, than good. And I was always too shy to make many friends.

7 Over dinner Helen would talk about the choir she was singing in or the great basketball shot she had made, and I would push the food around on my plate. I knew that Helen wasn't trying to make me feel bad. She was just excited about what she was accomplishing. But I couldn't help feeling like an outsider because I couldn't do what she was doing.

My notes about what I am reading

8 Then Zayde came for dinner one night. He sat next to me at the table and listened carefully as Helen told about the events of her day. He complimented her on doing so well in her classes. The whole time I just kept pushing food around my plate. Then Zayde said, "Have I ever told you about the time I sat for a week on a street corner in New York?"

9 Zayde didn't wait for a response. He gently touched my wrist and began to tell his story, looking at me the whole time. When he finished, he leaned over and whispered to me, "Anna, why do you worry about what Helen does? You have yourself to worry about."

10 From then on I let Helen shine without feeling blinded by her, and I sought out my own ways to sparkle. When I looked at myself more clearly, I saw that I excelled in my own ways. I found my place in the world of science and will soon be enrolling in medical school. I'm confident that I'll be an excellent doctor. On those days when I feel angry, hurt, or envious of another person, I pick up the phone and ask Zayde to tell me a story—*the* story. His words of wisdom, earned over 78 years of life experience, make it clear to me that he possesses the kind of wealth I hope to acquire. And I hope that my story will someday be as priceless as my grandfather's.

1 In paragraph 8, Zayde begins to tell his New York story because —

A he can tell that Anna is feeling sorry for herself

B he wants to surprise the girls with their favorite tale

C he is tired of hearing about what Helen is doing

D he wants to make both girls feel more confident

2 Anna sees her problems in a different way when she —

F is able to relate her situation to her grandfather's experiences

G talks with Helen about the differences between them

H figures out what it is about Helen's behavior that is bothering her

J no longer needs her grandfather's advice and encouragement

3 The author uses a flashback in paragraphs 3 through 9 to —

A explain what the narrator has chosen as a career

B describe how Zayde has influenced the narrator throughout her life

C list the qualities that the narrator's sister possesses

D compare Zayde to other members of the narrator's family

4 When did Zayde learn to think more about what he needed to do and less about what others were doing?

F Immediately after arriving in the United States

G While describing his life to Anna

H Right after marrying Anna's grandmother

J After a week sitting on a New York City street corner

5 The use of the word outsider in paragraph 7 helps the reader know that Anna feels —

A embarrassed by her family

B angry with her sister

C uncomfortable with herself

D betrayed by her grandfather

6 The author organizes this selection mainly by —

F recounting the events in Anna's life in the order in which they happen

G explaining the causes of Anna's actions and the effect they have on her family

H showing how Anna and her sister work out their differences

J introducing Anna's grandfather and describing how he guided her

7 Which of these is the best summary of the selection?

A When Anna's grandfather first came to the United States from Kiev, he had difficulty creating a good life for himself. It was not easy for him to find a job, and he was often hungry. Eventually, he found work, met Anna's grandmother, and started his own family.

B Anna's sister Helen has many different talents. Anna, however, feels that there is very little she can do well and often compares herself to Helen. During family dinners Anna feels bad when she listens to Helen describe her accomplishments.

C While Anna is growing up, she spends a lot of time with her grandfather. He is the person she trusts most. He tells her about his experience moving from the Soviet Union to the United States as a young person. Even though Anna is now in college, she still drives two hours every Sunday to visit him.

D Anna is especially close to her grandfather, who has often told her the story of his early struggles as an immigrant. When she is 13 and envious of her sister's talents, her grandfather helps her understand the importance of his story. What Anna learns helps her use her own talents later in life.

8 In the future, Anna will probably —

F decide that working in the field of medicine is not something she enjoys

G pass on her own experiences to young people in her life

H ask her grandfather to take her to visit his homeland

J wonder whether her sister has more to offer the world than she does

9 What is the main theme of Zayde's New York story?

A People should not move too far away from their families.

B People should be more attentive to those who are in need.

C People should not allow anger and envy to distract them from their goals.

D People should follow their dreams even if doing so causes pain to those around them.

10 Paragraph 6 is mostly about —

F the effect that sports have on Anna

G why Anna has few friends

H the activities Helen and Anna pursue

J Anna comparing herself to Helen

11 Why is it ironic that the setting of Zayde's story is a busy street corner?

A It highlights the excitement he felt about living in a new place.

B It creates a contrast between hectic city life and peaceful country life.

C It illustrates why he has chosen to be in a strange new environment.

D It emphasizes how lost and lonely he was even with so many people around him.

12 Which sentence from the selection shows how Anna's grandfather has influenced her?

F *It is because of Zayde Bobrov that I know what to worry about and what not to worry about in my life.*

G *He told me that the voyage across the ocean made him sick, not from the crowded ship's motion, but from the smells and rotten food.*

H *He sat next to me at the table and listened carefully as Helen told about the events of her day.*

J *I knew that he had worked hard to support his family.*

Read the next two selections. Then answer the questions that follow them.

The Box That Rocks

My notes about what I am reading

1 In the hands of an unschooled beginner, it can sound like the tortured groaning of a dozen cats with stomach problems. It can clear a room like a 30-pound skunk. It can bring scorn and ridicule from unhappy neighbors and former friends. But powered by the strong arms of a confident expert, the accordion is the box that rocks.

2 Affectionately referred to as a squeezebox, the accordion is essentially two large harmonicas joined by a collapsible bellows. By squeezing together and pulling on the sides, the player forces air through the instrument. Depending on the force and speed used, the accordion can produce sad and mellow tunes for a quiet evening or loud and raucous dance music for a wild party. The accordion descended from the Chinese *sheng*, an instrument invented about 2,000 years ago. The accordion that westerners would recognize was developed in Europe in the early 1800s.

Accordion with bellows expanded

© Guy Ricles/Dreamstime #24766?

3 Eastern European immigrants brought the accordion with them to Texas in the second half of the 1800s. The sound of an accordion told everyone that the fun was about to begin after a hard day of work. Its bellows breathed life into gatherings and fueled the dancing of hundreds of people. Before microphones and sound systems, it could make waltzes and polkas roar from blocks away.

4 Around this time Patricio Jiménez began to attend dances that featured accordion music, and he liked what he heard. He gave the polkas the name oom-pah-pah music for their strong rhythmic pattern. This fun music was so infectious that he wanted to create the same kind of joy in his own music. Beginning with the simplest accordion, which had only one row of buttons, Patricio learned to play the polkas he had heard. Eventually he was playing the

accordion at parties and making people dance. There was always a demand for a good accordion player, and Jiménez had become one.

My notes about what I am reading

5 Patricio's son Santiago was born in 1913 and was playing the accordion by the time he was seven years old. Patricio brought Santiago with him to play at parties. Santiago was a natural, as if the music was in his blood. Before long he was writing lyrics in Spanish to go along with the music. He made his father's music his own. Combining elements of polka with Mexican rhythms, he created music known as *conjunto*. He released his first record when he was just 23.

6 Santiago's son Flaco was born in 1939 and has carried on the family tradition. "My grandfather died before I was born. It would have been a thrill for me to know him and hear the way he played," Flaco says. "My dad told me a lot of stories about the European polkas that my grandpa played. By watching my father play, I saw how my grandfather played."

7 But Flaco doesn't just play the way his father and grandfather played. He has experimented with different styles and has earned the respect of many distinguished musicians. The rock band the Rolling Stones asked him to play with them for an album in 1994. After winning five Grammy awards, Flaco has made it official: The squeezebox rocks!

Tiger Tales Magazine

MUSIC IN THE NEWS

October 2005

To Their Own Beat

by Tommy Ruiz

1 When Los Lobos perform in concert today, audiences in the thousands cheer them on. It's hard to believe that the group started out as just another garage band playing popular rock-and-roll tunes from the radio. In 1974 four high school friends from East Los Angeles formed Los Lobos (Spanish for "The Wolves"). David Hidalgo and César Rosas played guitar, Conrad Lozano played bass guitar, and Louie Pérez played drums.

2 Like many garage bands, these buddies might have simply gone their separate ways after high school. But the members of Los Lobos wanted to keep making music together. They decided to change their musical style and began focusing on traditional Mexican music that reflected their heritage.

3 "We pulled out all those records we used to beg our parents not to play around our friends and found an incredible wealth of music," says Pérez. "These guys [on the records] were doing amazing things with their instruments, and we started trying to pick up on it."

4 The group put aside its electric guitars for the acoustic ones used in traditional Mexican music. For several years Los Lobos played at weddings, *Quinceañeras*,[1] private parties—any function that needed live music. They also landed a regular engagement at a Mexican restaurant.

5 By 1978 Los Lobos had made enough money to record their first album, and they sold copies of it wherever they performed. They also returned to their electric guitars to get closer to a Tex-Mex sound, which is a mixture of traditional Mexican music, rock and roll, country music, and the blues. This new, louder sound produced one unintended result: the group was fired from the restaurant.

6 But it didn't matter that Los Lobos had lost their one steady job, because they had found a niche that no other group occupied. They had combined electric and acoustic instruments and blended musical styles in their own way. Steve Berlin joined the band in 1983 as the saxophone and keyboard player, adding to the band's unique sound.

7 "We didn't so much want to recycle the music we'd grown up with as much as find the common links between it and all the other styles and sounds that were all around us," Pérez explains. "It became a

■ **see Own Beat, page 12**

[1] A *Quinceañera* is a celebration in honor of a Hispanic girl's fifteenth birthday.

■ Own Beat, cont. from page 11

mission, almost a crusade . . . bringing music together to bring people together."

8 In the 1980s Los Lobos gained the attention of several record companies. They were hired to perform on the soundtrack to the film *La Bamba*, which earned them a Golden Eagle Award. They have since earned many awards, including two Grammys and an MTV Video Music Award. Their many records have been very successful, and they have toured the world.

Even after 30 years of making music together, Los Lobos continue to experiment with their sound. They never stray far from their Mexican roots, however. They still include traditional music in their live performances, sharing their legacy—and their culture—with their fans. *9*

Los Lobos

© Los Lobos/Red Light Management

Use "The Box That Rocks" (pp. 10–11) to answer questions 13–16.

13 Read this sentence from paragraph 3.

> *Its bellows breathed life into gatherings and fueled the dancing of hundreds of people.*

The author uses personification to indicate that the accordion —

A created a need for better sound equipment at gatherings

B could help people who were ill feel healthy

C produced a great deal of wind that blew on the audience

D could make a tired audience become spirited and awake

14 In paragraph 5, the author uses words such as "a natural" and "was in his blood" to convey —

F the ease with which Santiago Jiménez played

G Santiago Jiménez's views of his father

H the urgency with which Santiago Jiménez practiced

J Santiago Jiménez's initial confusion about music

15 Which of these is the best summary of the selection?

A Nearly 2,000 years ago the Chinese invented an instrument called the *sheng*. In the 1800s Europeans developed the accordion, a more modern version of the *sheng*, and immigrants later brought it to North America. The accordion eventually became known as the squeezebox because sound was produced by squeezing the instrument and forcing air through its bellows.

B The accordion is an instrument that can sound horrible in the wrong hands, but it can sound great when played well. Its sound is actually produced by two large harmonicas. A bellows forces air through the instrument to produce sound. Skilled players can make either slow, sad tunes or upbeat dance music.

C Flaco Jiménez is the best-known accordion player today. He learned how to play the instrument from his father Santiago, who learned from his own father Patricio Jiménez. Flaco has heard the stories about the European polkas that Patricio played and believes that he learned about accordion technique by watching his father play.

D Descended from the Chinese *sheng*, the accordion can produce wonderful music in the hands of talented musicians such as the men of the Jiménez family. Inspired by polka music, Patricio Jiménez launched the family tradition by becoming an accomplished accordion player. His son Santiago and his grandson Flaco also became highly respected accordion players.

16 Based on information provided in the selection, the reader can conclude that musicians —

F often enjoy their greatest success while they are young

G choose what careers their children will pursue

H are not concerned with the preferences of their fans

J sometimes pass their interest in music on to their children

Use "To Their Own Beat" (pp. 12–13) to answer questions 17–21.

17 Los Lobos lost their job performing in a restaurant because —

- **A** their music became too loud
- **B** they preferred to perform at weddings
- **C** their music was attracting too large a crowd
- **D** they needed to spend time recording their first album

18 The reader can conclude that the members of Los Lobos attribute their success mostly to —

- **F** their blending of different types of music
- **G** the way they recorded their first album
- **H** their decision to allow their songs to be used in movies
- **J** the fact that they perform at a variety of events

19 Paragraph 8 is mainly about the —

- **A** record companies that hoped to work with the band
- **B** band's success and various awards
- **C** number of albums the band has produced
- **D** places the band has visited on its world tours

20 Los Lobos recorded their first album after they —

- **F** began playing acoustic guitars
- **G** lost their job at a restaurant
- **H** won an award for a film soundtrack
- **J** added saxophone and keyboards to their sound

21 The author chose the title of this article to highlight the band's —

- **A** commitment to creating its own musical identity
- **B** interest in the popular music of today
- **C** memories of performing together as teenagers
- **D** experiences touring the world

Use "The Box That Rocks" and "To Their Own Beat" to answer questions 22–25.

22 How are the members of the Jiménez family similar to the members of Los Lobos?

F They followed closely in the same paths of their fathers and grandfathers.

G They had to lose some jobs before getting better ones later on.

H They began their musical careers in one country and gained fame in another.

J They borrowed from various cultures to establish a new sound.

23 How are the selection and the article different?

A "The Box That Rocks" explores the history behind a variety of instruments, while "To Their Own Beat" focuses on the history of just one instrument.

B "The Box That Rocks" provides a biography of a modern musician, while "To Their Own Beat" investigates where a type of music originated.

C "The Box That Rocks" provides a history of the instrument played by the Jiménez family, while "To Their Own Beat" does not discuss the origins of the instruments played by Los Lobos.

D "The Box That Rocks" tells mainly about musicians of Mexican descent, while "To Their Own Beat" tells mainly about musicians of European descent.

24 Both the selection and the article suggest that music —

F represents many cultures

G is best when played loudly

H should remain the same over time

J must be recorded to be enjoyed

25 Which of these sentences from "The Box That Rocks" also describes how the members of Los Lobos feel about their music?

A *Around this time Patricio Jiménez began to attend dances that featured accordion music, and he liked what he heard.*

B *He has experimented with different styles and has earned the respect of many distinguished musicians.*

C *Patricio's son Santiago was born in 1913 and was playing the accordion by the time he was seven years old.*

D *In the hands of an unschooled beginner, it can sound like the tortured groaning of a dozen cats with stomach problems.*

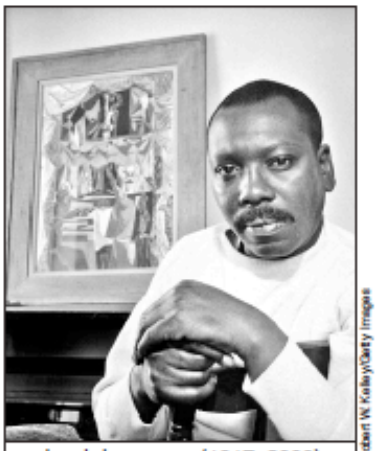
Read this selection. Then answer the questions that follow it.

The Painter

My notes about what I am reading

1 Jacob Lawrence was extraordinary. I could tell it from the moment I met him. Maybe it was the way he talked. Or maybe it was the way he acted. For a famous artist he didn't have even a hint of ego about him. His open manner made him pleasant to be around. This was the first thing I noticed about him when I, a nervous college student, walked into the art class he taught at the University of Washington in Seattle. It was 1980, and I couldn't have predicted then what an effect this quiet man would have on the rest of my life.

2 Other than being impressed by Lawrence's artwork, I was surprised at how his story mirrored my own. Lawrence spent most of his childhood in Harlem, a mostly African American neighborhood in New York City—the same city I grew up in almost 40 years after he did. He discovered painting during the 1930s at an after-school program when he was 13 years old. He first painted with tempera paint, which was the first kind of paint that I began using as a boy in school. The paint was, and still is, cheap. During the Great Depression, when Lawrence began painting, everyone was searching for ways to save money. Lawrence liked the bright colors of the tempera paint so much that he continued to use it throughout his career, even after he could afford higher-quality paints.



Jacob Lawrence (1917–2000)

© Robert W. Kelley/Getty Images

3 Lawrence didn't spend much time talking about himself in his art class, so I read about him on my own. I read that people first noticed his paintings because of how striking they were. His paintings caught a person's attention immediately because Lawrence had a style that was all his

My notes about what I am reading

own. When he painted a picture, he liked to paint using one color at a time. He might begin with red and paint everything that he wanted red in his picture first. Then he would paint the next color. Even if the painting did not appear to make sense in the beginning, by the time all his colors had been added, the images were complete and powerful.

A Panel from Lawrence's Series on the Life of Toussaint-Louverture

© 2007 The Jacob and Gwendolyn Lawrence Foundation, Seattle/Artists Rights Society (ARS), New York & Art Resource

4 When Lawrence was in his twenties, African American artists had to work very hard to gain recognition. But he continued to paint, and word of his talent and unique style slowly began to spread. Lawrence painted scenes from everyday life in Harlem, as well as portraits of his favorite black heroes. He valued his heritage. Late in life he decided to honor the first black hero that he had learned about as a boy, Toussaint-Louverture, the former slave who founded the Republic of Haiti. Lawrence set about this ambitious project using his signature technique. He laid out 41 large panels. Then, after sketching the scenes he wanted to paint, he began with one color and applied that color across all the panels before picking up the next color. He continued this process until he had painted the significant events from Toussaint's life—from birth to victory in the Haitian Revolution.

My notes about what I am reading

5 I admire the fact that Lawrence became known as a talented African American artist. But he was bothered by this fact. He didn't want to be known as a good African American artist. He wanted to be known as a good artist. Lawrence said, "I would like to see them buy my art, buy the art of other Negro artists. I would like to see this done. But again, I would like to see them buy it because it's a good work of art."

6 Good art was something that Edith Halpert knew about. Her exclusive art gallery in downtown New York City featured top American artists. Before she became aware of Lawrence, no famous gallery had included the art of African Americans. Halpert decided to change this and invited Lawrence to display his famous Migration Series of paintings at her gallery. He now had a passport to international fame. Soon museums wanted to purchase his art, and his work appeared in a national magazine. Lawrence was gaining recognition for his talent, not his race, and his dream of becoming a respected American artist, not just a good African American artist, was coming true.

7 By the time I met Lawrence in my college art class, he had long been regarded as one of the greatest American artists of the twentieth century. What's amazing is that an artist of his stature would take the time to teach students like me. It seemed to me that he truly enjoyed sharing ideas and knowledge with others. He was never one to tell his students that what they painted was wrong. He guided us toward painting what was really inside us, where our hopes and dreams resided.

8 That is why after college I returned to the neighborhood where I had grown up to teach art at an after-school program for inner-city youth while I worked on my own artistic style. I knew I would someday have a story to tell with my art, just as Lawrence had. But until my story was told, I wanted to help my students work on stories of their own.

26 The narrator is surprised when he first meets Lawrence because they both —

F grew up in the same city

G have a similar painting style

H have successful art careers

J share a love of bright colors

27 What are paragraphs 7 and 8 mostly about?

A What qualities make a person a good art teacher

B Why the narrator likes teaching art to inner-city kids

C How meeting Jacob Lawrence influenced the narrator

D How Jacob Lawrence wanted to tell a story with his painting

28 Which sentence best shows that Lawrence wanted his students to express themselves?

F *It was 1980, and I couldn't have predicted then what an effect this quiet man would have on the rest of my life.*

G *By the time I met Lawrence in my college art class, he had long been regarded as one of the greatest American artists of the twentieth century.*

H *He guided us toward painting what was really inside us, where our hopes and dreams resided.*

J *I knew I would someday have a story to tell with my art, just as Lawrence had.*

29 Throughout this selection, the tone is —

A mysterious

B respectful

C playful

D sympathetic

30 Which idea demonstrates that having work shown in Edith Halpert's gallery was an important accomplishment?

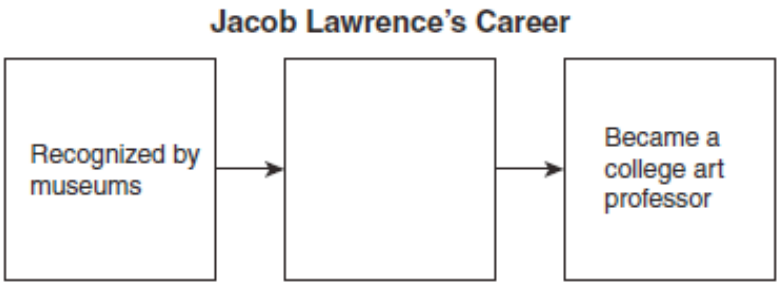
F Halpert's gallery displayed some of America's top artists.

G Halpert was one of the first to show an interest in Lawrence's talent.

H Halpert's gallery was located in downtown New York City.

J Halpert was very knowledgeable about Lawrence's art.

31 Look at the time line below.



Which of the following belongs in the empty box?

A Honored the life of a black hero with several paintings

B Learned to paint at an after-school art program

C Started the practice of painting one color at a time

D Gained worldwide recognition for his painting

---

32 The author probably wrote this selection to —

F compare a student's work to Lawrence's

G persuade people to buy Lawrence's paintings

H explain how he was inspired by Lawrence

J describe the art world of the twentieth century

33 Which words in paragraph 3 help the reader know what striking means?

A *caught a person's attention*

B *one color at a time*

C *in the beginning*

D *painted a picture*

34 Based on the author's viewpoint, the reader can tell that Lawrence —

F showed talent for many forms of art

G helped students develop their artistic talent

H shared stories about his life with students

J had a sense of humor about his work

35 Why does the author focus on the fact that Lawrence liked to paint black heroes?

A To emphasize Lawrence's interest in historical figures

B To suggest that Lawrence's skill was unique

C To list examples of Lawrence's best work

D To show Lawrence's pride in his heritage

36 Read this sentence from paragraph 6.

> *He now had a passport to international fame.*

The author uses this sentence to —

F compare Lawrence with other artists

G show that Edith Halpert provided Lawrence new opportunities

H suggest that Lawrence would soon be traveling

J emphasize that Lawrence would become more influential than Edith Halpert

37 The narrator decides to teach art at an after-school program because he —

A wants to do for others what Lawrence did for him

B knows that he has few opportunities to become a famous painter

C hopes to meet important artists in Lawrence's old neighborhood

D believes that teaching is more important than art

Read this selection. Then answer the questions that follow it.

The Rumor

My notes about what I am reading

1 "Tell me this is the last one," Beth groaned, tossing her paintbrush onto a piece of newspaper. She looked down at the huge banner she and her friends Alex and Jen were painting. It read, "Choose Beth Sullivan for Student Council President."

2 Alex shook his head and said, "Kendra's got almost twice as many posters as you have. We need to make at least six more."

3 Beth had been a member of the student council for two years. She was always the one to volunteer when there was extra work to be done, such as selling tickets for a dance or cleaning up after a pizza party. This year she finally felt ready to step into the spotlight. She knew that she deserved a little recognition, and she was sure she could help make the student council the best it could be. Everyone who knew her well said she would make a great president.

4 Then a new girl—Kendra—transferred to Briar Middle School. Even though she had been at Briar for only a few months, she was already very popular. Now she was running against Beth for student council president. The race had looked pretty even at first, but now that it was

My notes about what I am reading

closer to election time, Kendra seemed to have more support.

5 "I hate to say this," Jen said, "but after second period today, I counted 47 'Kendra' buttons and only 22 'Beth' buttons." She sighed. "Kendra was smart to hand out candy with her buttons."

6 "Counting buttons? Don't you think we're being a little obsessive? Counting banners, counting buttons—what are you going to count next? How many more friends she has than me?" Beth said, irritated.

7 "Face the facts, Beth," Alex said. "You won't win this election unless we do something drastic."

8 "I appreciate your support," Beth said, "but we can't force people to vote for me. We'll just have to do what we can. Right now that means more posters!" she added, trying to sound more cheerful.

9 A few days later Beth was in her math class, the only class she had with Kendra. She noticed that when Kendra walked in, a group of girls started whispering. Usually these same girls were fawning over Kendra, eagerly agreeing with everything she said.

10 When the class ended, one girl grabbed Beth's arm. "I *was* going to vote for Kendra," she said loudly to make sure Kendra heard her, "but since she thinks she's too good for our school, I've changed my mind."

11 "What are you talking about?" Kendra turned and asked, looking as puzzled as Beth.

12 "Don't act so innocent, Kendra. You know what you said," the girl replied. She and her friends walked off, leaving Kendra and Beth staring at each other. Kendra looked genuinely upset.

13 Later on Beth saw the girls from her math class talking to several other students. She heard one of them say, "She's only pretending to be nice. She's been making fun of us this whole time."

14 "I always knew Kendra was a phony," said another girl.

15 Beth joined the group and asked, "Is this really true?"

16 "Well, yeah, of course," one of them said. "Patty overheard Kendra talking on her cell phone at the mall.

My notes about what I am reading

She was talking bad about the whole school. You should have heard what she said about *you*."

17 Beth's heart sank. Patty was Alex's cousin. Instantly Beth thought about what Alex had said the day before: *"You won't win this election unless we do something drastic."* Was it possible that Alex persuaded Patty to help him start a rumor about Kendra to get Beth elected? Beth kept picturing Kendra's shocked face after math class.

18 At lunch that afternoon Alex was ecstatic. "I saw only about 10 'Vote for Kendra' buttons today," he gloated. "The trash cans are full of them!"

19 Beth interrupted, looking directly at Alex. "Did you have anything to do with this rumor that's going around?"

20 "Of course not," Alex said with a slight smile that betrayed his words.

21 "I knew it. How could you do something like that?" she said reproachfully. "I've lost now for sure. When the truth gets out, everyone will think *I'm* behind this rumor. I probably won't even be allowed to be in the student council at all!"

22 Alex looked apologetic. "I'm sorry. But no one needs to know what I did. After the election everyone will forget about this. Come on, Beth! You deserve to be president. You know you do!"

23 Beth was too upset to answer. There wasn't time to stop the rumor. She knew she should do the right thing, even though it meant she might not win the election.

24 The next day the whole school gathered in the gym to hear Kendra and Beth make their campaign speeches. Beth went first. She looked at the sea of faces in the bleachers and swallowed hard. "Recently," she said, "I learned of a rumor about my opponent. I also know that people have been planning to change their votes as a result. I assure you that I personally did not start this rumor, but I do know that it isn't true, and I don't want to be elected for the wrong reasons." Beth looked out at the crowd. "I'd like to tell you about my experience with the student council . . ."

38 In the beginning, why does Kendra seem likely to win the election?

- **F** She has election experience.
- **G** She has sold many dance tickets.
- **H** She makes all her own posters.
- **J** She is well liked by the other students.

39 Which of the following best describes the conflict in the story?

- **A** Alex tries to help Beth, but she does not approve of his method.
- **B** Beth wants to be popular, but people are more interested in Kendra.
- **C** Kendra and Beth must make speeches, but neither has much experience.
- **D** Beth works hard on her campaign, but Kendra does not want her to win.

40 Why does the author repeat Alex's words in paragraph 17?

- **F** To reveal the results of the unfortunate rumor
- **G** To describe Kendra's expression after math class
- **H** To show that Beth suspects who started the rumor
- **J** To suggest that Beth didn't understand what he had said

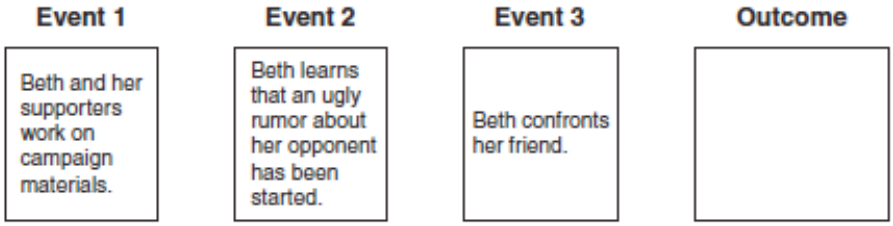
41 Why do the girls who like Kendra change their minds about her so quickly?

- **A** They remember that they are Beth's friends.
- **B** They are easily influenced by gossip.
- **C** They want to help Beth win the election.
- **D** They want to start a fight between the candidates.

42 In paragraph 20, the phrase "smile that betrayed his words" indicates that Alex —

- **F** was happy about telling Beth the truth
- **G** was planning to convince Beth to withdraw from the election
- **H** was not saying what he was thinking
- **J** was angry about Beth's question

43 Use this story map to answer the question below.



Which of these belongs in the empty box of the story map?

A Beth accuses Patty of being untruthful.

B Kendra discovers that her classmates like her less than she originally believed.

C Alex worries that Beth will lose the election.

D Beth realizes that she doesn't want to win for the wrong reasons.

---

44 How does Beth feel when she learns that Jen has been counting campaign buttons?

F Annoyed

G Discouraged

H Betrayed

J Suspicious

45 In paragraph 9, the word fawning means —

A pestering someone for advice

B challenging someone with demands

C helping someone with problems

D giving someone extra attention

46 Which important idea is expressed throughout this selection?

F Hard work pays off.

G Disloyalty is common.

H Harshness in politics is necessary.

J People should not lie to achieve success.

47 In paragraph 3, "step into the spotlight" means to —

A follow the easiest path

B become the focus of attention

C feel the demands of school

D have the best opportunity

48 By the end of the selection, the reader can conclude that Beth is —

F foolish

G honorable

H imaginative

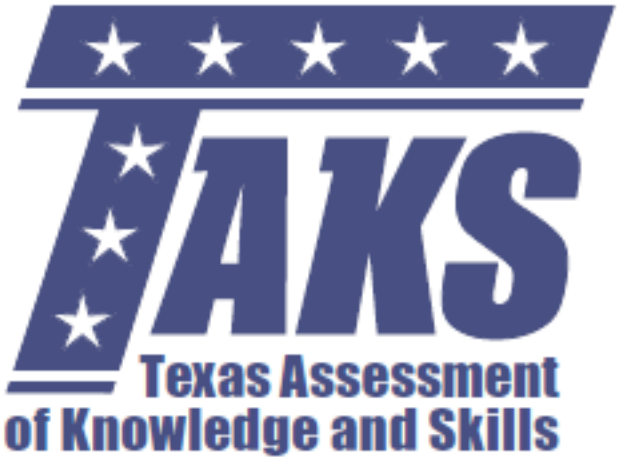
J jealous

Texas Assessment of Knowledge and Skills - Answer Key

Grade: 08
Subject: Reading
Administration: March 2009

Item Number	Correct Answer	Objective Measured	Student Expectations
01	A	03	8.10 (E)
02	F	02	8.12 (F)
03	B	02	8.12 (J)
04	J	03	8.10 (E)
05	C	01	8.9 (F)
06	J	04	8.12 (I)
07	D	01	8.10 (G)
08	G	04	8.10 (H)
09	C	04	8.11 (D)
10	J	01	8.10 (F)
11	D	02	8.12 (J)
12	F	04	8.11 (C)
13	D	02	8.12 (J)
14	F	04	8.12 (K)
15	D	01	8.10 (G)
16	J	04	8.10 (H)
17	A	01	8.10 (F)
18	F	04	8.10 (H)
19	B	01	8.10 (F)
20	F	03	8.10 (E)
21	A	04	8.12 (K)
22	J	03	8.10 (I)
23	C	04	8.11 (D)
24	F	04	8.11 (D)
25	B	04	8.11 (C)
26	F	01	8.10 (F)
27	C	01	8.10 (F)
28	H	02	8.12 (F)
29	B	04	8.12 (K)
30	F	04	8.11 (C)
31	D	03	8.10 (L)
32	H	03	8.12 (A)
33	A	01	8.9 (B)
34	G	03	8.12 (H)
35	D	03	8.12 (A)
36	G	02	8.12 (J)
37	A	02	8.12 (F)
38	J	01	8.10 (F)
39	A	02	8.12 (G)
40	H	04	8.12 (K)
41	B	03	8.10 (E)
42	H	02	8.12 (J)
43	D	03	8.10 (L)
44	F	02	8.12 (F)
45	D	01	8.9 (B)
46	J	04	8.11 (D)
47	B	01	8.9 (B)
48	G	04	8.10 (H)

STUDENT NAME _____



GRADE 8
MATHEMATICS

Mathematics Chart

LENGTH

Metric	Customary
1 kilometer = 1000 meters	1 mile = 1760 yards
1 meter = 100 centimeters	1 mile = 5280 feet
1 centimeter = 10 millimeters	1 yard = 3 feet
	1 foot = 12 inches

CAPACITY AND VOLUME

Metric	Customary
1 liter = 1000 milliliters	1 gallon = 4 quarts
	1 gallon = 128 fluid ounces
	1 quart = 2 pints
	1 pint = 2 cups
	1 cup = 8 fluid ounces

MASS AND WEIGHT

Metric	Customary
1 kilogram = 1000 grams	1 ton = 2000 pounds
1 gram = 1000 milligrams	1 pound = 16 ounces

TIME

1 year = 365 days

1 year = 12 months

1 year = 52 weeks

1 week = 7 days

1 day = 24 hours

1 hour = 60 minutes

1 minute = 60 seconds

Mathematics Chart

Perimeter	square	$P = 4s$
	rectangle	$P = 2l + 2w$ or $P = 2(l + w)$
Circumference	circle	$C = 2\pi r$ or $C = \pi d$
Area	square	$A = s^2$
	rectangle	$A = lw$ or $A = bh$
	triangle	$A = \frac{1}{2}bh$ or $A = \frac{bh}{2}$
	trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$ or $A = \frac{(b_1 + b_2)h}{2}$
	circle	$A = \pi r^2$
P represents the Perimeter of the Base of a three-dimensional figure.		
B represents the Area of the Base of a three-dimensional figure.		
Surface Area	cube (total)	$S = 6s^2$
	prism (lateral)	$S = Ph$
	prism (total)	$S = Ph + 2B$
	pyramid (lateral)	$S = \frac{1}{2}Pl$
	pyramid (total)	$S = \frac{1}{2}Pl + B$
	cylinder (lateral)	$S = 2\pi rh$
	cylinder (total)	$S = 2\pi rh + 2\pi r^2$ or $S = 2\pi r(h + r)$
Volume	prism	$V = Bh$
	cylinder	$V = Bh$
	pyramid	$V = \frac{1}{3}Bh$
	cone	$V = \frac{1}{3}Bh$
	sphere	$V = \frac{4}{3}\pi r^3$
Pi	π	$\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$
Pythagorean Theorem		$a^2 + b^2 = c^2$
Simple Interest Formula		$I = prt$

DIRECTIONS

Read each question. Then fill in the correct answer on your answer document. If a correct answer is not here, mark the letter for "Not here."

SAMPLE A

Find the greatest common factor of 12 and 18.

A 3

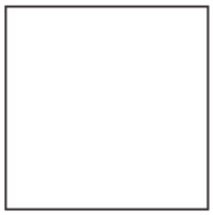
B 6

C 9

D Not here

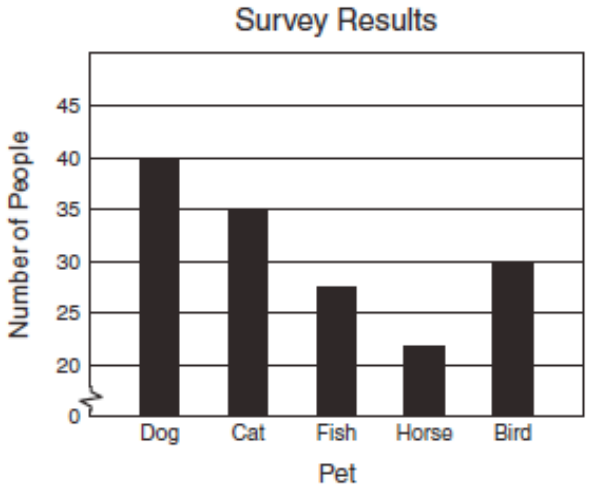
SAMPLE B

Find the perimeter of this square rug in meters.



Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

1 The graph below shows the results of a survey about the animal that people prefer as a pet.



According to this graph, which statement is true?

A Twice as many people prefer dogs to fish.

B Most people do not prefer horses as pets because they are too big to care for.

C Many people prefer fish as pets because they are easy to care for.

D Five more people prefer cats to birds.

---

2 Tomás will earn $45 for each mile he walks in a charity walkathon. Tomás walks between 8 and 12 miles during the walkathon. Which of the following is a possible amount he will earn for the charity?

F $405

G $315

H $630

J $900

3 Marta is twice as old as Jamie, and Angie is one-fourth the age of Kelly. Kelly is 8 years older than Marta. Jamie is 20 years old. Who is the youngest?

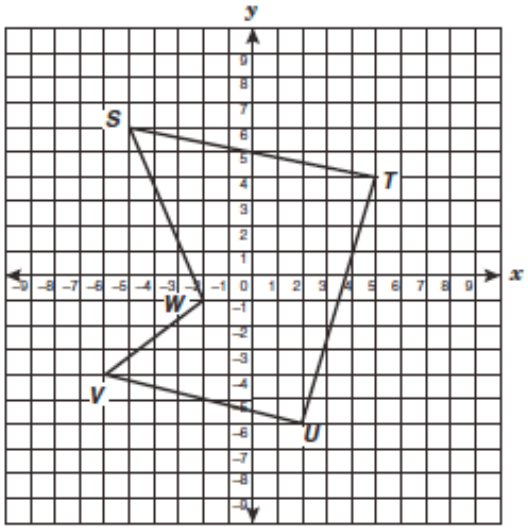
A Marta

B Jamie

C Angie

D Kelly

4 Figure $STUVW$ will be translated 5 units left and 7 units up to form figure $S'T'U'V'W'$.



Which ordered pair best represents point W'?

F $(3, 6)$

G $(-2, 1)$

H $(-7, 6)$

J $(2, -1)$

---

5 A mistake was made in simplifying the expression below.

Simplify: $5 + 2(6 + 4) - 2^3$

Step 1: $5 + 2(10) - 2^3$

Step 2: $7(10) - 2^3$

Step 3: $70 - 2^3$

Step 4: $70 - 8$

Step 5: 62

In which step did the mistake first appear?

A Step 1

B Step 2

C Step 3

6 A truck driver travels at an average speed of 53 miles per hour. Which equation can be used to find d, the distance the truck driver will travel in $3\frac{1}{2}$ hours?

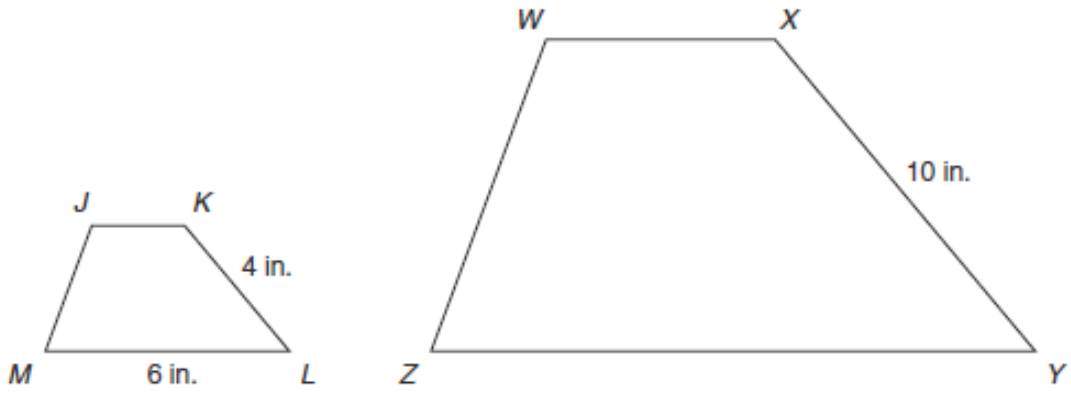
F $d = 53 \cdot 3\frac{1}{2}$

G $d = 53 \div 3\frac{1}{2}$

H $d = 3\frac{1}{2} \div 53$

J $d = 3\frac{1}{2} + 53$

7 Trapezoid *JKLM* is similar to trapezoid *WXYZ*.



What is the length of $\overline{YZ}$?

A $6\frac{2}{3}$ in.

B 12 in.

C $10\frac{2}{3}$ in.

D 15 in.

8 The table below shows the value of the first five terms in a sequence.

Position	Value of Term
1	13
2	8
3	3
4	–2
5	–7
n	?

Which expression can be used to find the value of the nth term?

F $5n - 2$

G $23 - 6n$

H $15 - 2n$

J $18 - 5n$

9 A store manager collects data showing the number of times each brand of soap is purchased in his store. Which measure of data shows which brand he sells most?

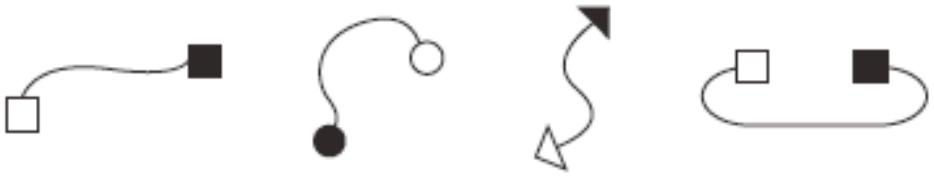
A Range

B Mean

C Mode

D Median

10 The following figures are in Set R.



The following figures are not in Set R.

Which of the following figures belongs in Set R?

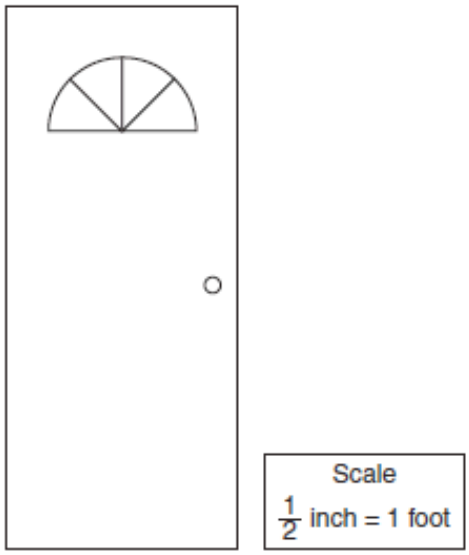
F

H

G

J

11 The scale drawing below shows a door. Use the ruler on the Mathematics Chart to measure the dimensions of this door to the nearest $\frac{1}{2}$ inch.



Which of the following dimensions are closest to those of the actual door?

A $2\frac{1}{2}$ feet wide and $6\frac{1}{2}$ feet high

B $2\frac{1}{2}$ feet wide and 7 feet high

C 3 feet wide and $6\frac{1}{2}$ feet high

D 3 feet wide and 7 feet high

---

12 Which of the following numbers is greater than -1.075?

F -2.03

G -1.90

H -1.06

J -1.26

13 The table below shows monthly water rates for using g gallons of water.

Monthly Water Rates

Water Used (gallons)	Total Cost (dollars)
First 8,000	7
8,001 to 13,000	$7 + 0.0012(g - 8{,}000)$
13,001 to 18,000	$13 + 0.002(g - 13{,}000)$
More than 18,000	$23 + 0.0032(g - 18{,}000)$

What is the total cost for a business that uses 10,000 gallons in one month?

A \$7.00

B \$9.40

C \$17.00

D \$29.40

14 The probability of getting a red gumball from a gumball machine is $\frac{1}{8}$. The probability of getting a red piece of candy from a candy machine is $\frac{1}{6}$. If both a gumball and a piece of candy are purchased, what is the probability that both are red?

F $\frac{1}{48}$

G $\frac{1}{7}$

H $\frac{7}{24}$

J $\frac{1}{14}$

15 Gabby can assemble 7 music books in 4 minutes. At this rate, how many music books can she assemble in 2 hours?

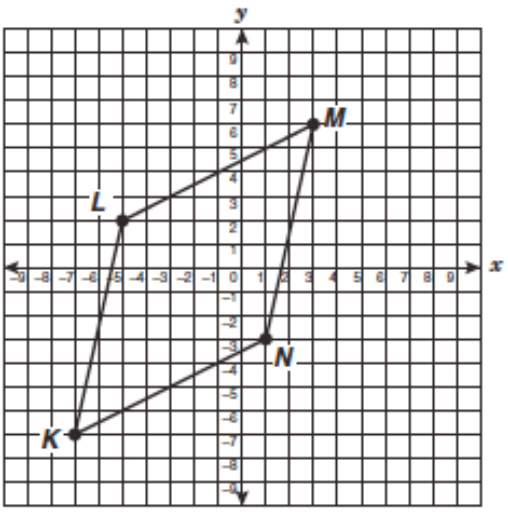
A 14

B 105

C 69

D 210

16 Parallelogram $KLMN$ has vertices $K(-7, -7)$, $L(-5, 2)$, $M(3, 6)$, and $N(1, -3)$.



Which of the following are coordinates of a point inside parallelogram $KLMN$?

F $(3\frac{1}{4}, 1\frac{1}{2})$

G $(-3\frac{3}{4}, 1\frac{1}{4})$

H $(-1\frac{3}{4}, -5\frac{1}{2})$

J $(\frac{1}{4}, -4\frac{1}{4})$

17 Jasmine is building birdhouses. It takes her $3\frac{1}{2}$ hours to build 4 birdhouses. Which of the following is an equivalent rate?

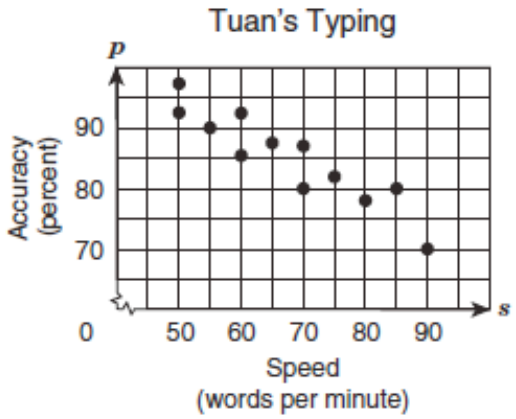
A 14 hours to build 18 birdhouses

B 28 hours to build 35 birdhouses

C 7 hours to build 8 birdhouses

D 21 hours to build 28 birdhouses

18 Tuan made the scatterplot below to show the relationship between his typing accuracy and his typing speed.



Which statement best describes the relationship shown in this scatterplot?

F There is no relationship between Tuan's typing speed and his typing accuracy.

G As Tuan's typing speed increased, his accuracy remained constant.

H As Tuan's typing speed increased, his accuracy increased.

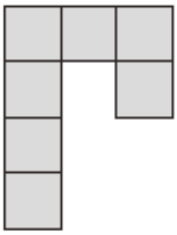
J As Tuan's typing speed increased, his accuracy decreased.

---

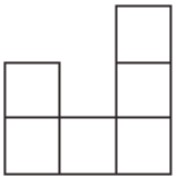
19 Marcos buys 15 folders that cost \$0.75 each and 6 pens that cost \$1.25 each. What is the total cost in dollars and cents of the folders and pens, not including tax?

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

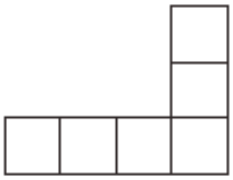
20 The drawings below show the top, front, and right-side views of a 3-dimensional figure built using identical cubes.



Top view



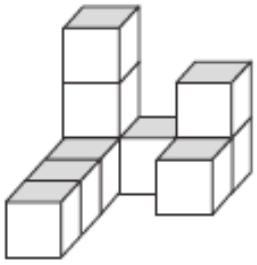
Front view



Right-side view

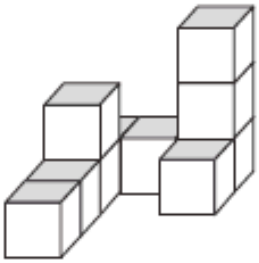
Which 3-dimensional figure do these views best represent?

F



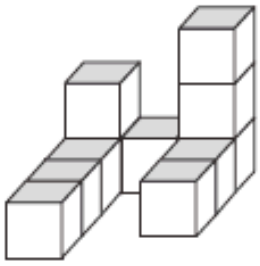
Front

H



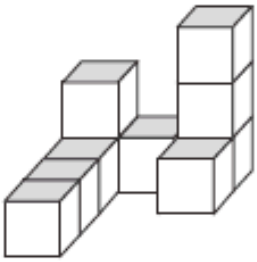
Front

G



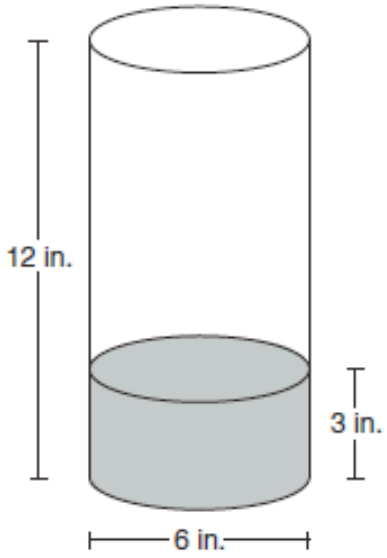
Front

J



Front

21 A cylindrical glass vase is 6 inches in diameter and 12 inches high. There are 3 inches of sand in the vase, as shown below.



Which of the following is closest to the volume of the sand in the vase?

A 85 in.^{3}

B 254 in.^{3}

C 54 in.^{3}

D 339 in.^{3}

22 A human red blood cell is about 0.000008 meter in diameter. Which of the following represents this number in scientific notation?

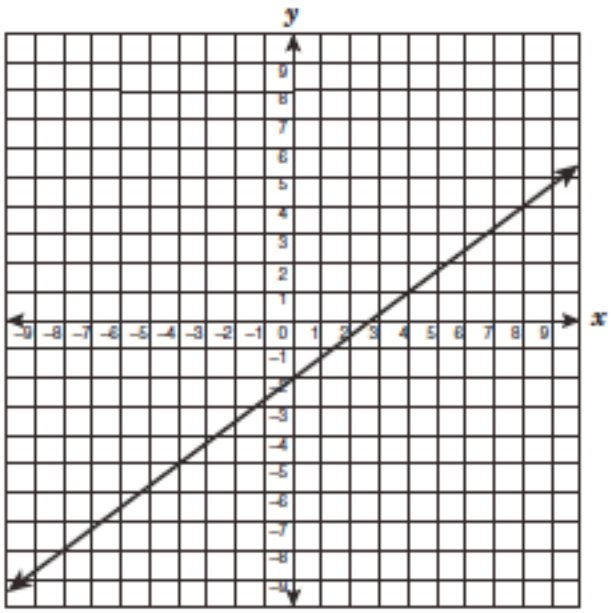
F 0.8×10^{-6}

G 8.0×10^{-6}

H 0.8×10^{6}

J 8.0×10^{6}

23 The graph of the equation $y = \frac{3}{4}x - 2$ is shown below.



Which table of values best represents ordered pairs on the graphed equation?

A

x	y
–8	–8
0	–2
4	–1

C

x	y
0	–2
1	4
8	4

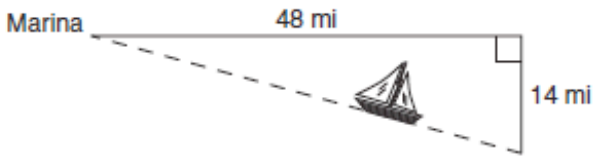
B

x	y
–4	–5
4	1
8	5

D

x	y
–4	–5
0	–2
4	1

24 Tai sailed east from the marina for 48 miles and then sailed south for 14 miles, as shown in the diagram.



What is the shortest distance Tai can sail to return to the marina?

F 62 mi

G 82 mi

H 50 mi

J 34 mi

---

25 In July 2005 the United States imported approximately 10.3 million barrels of oil per day. Canada supplied about 16% of the imported oil. Which of these is closest to the number of barrels of oil the United States imported from Canada each day?

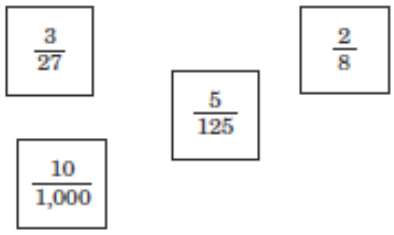
A 5.7 million

B 1.6 million

C 2.1 million

D 0.2 million

26 A set of tiles is shown below.



Which statement best describes the relationship between the numerators and denominators of these fractions?

F The denominator is the square of the numerator.

G The denominator is twice the numerator.

H The denominator is the cube of the numerator.

J The denominator is three times the numerator.

27 As part of a science experiment, four students each planted some flower seeds. After one week the students compared the number of seeds that germinated with the number of seeds planted. Their results are shown in the table below.

Science Experiment

Student	Result
Nadia	0.75
Eduardo	60%
Kim	$\frac{4}{5}$
Jordan	$\frac{2}{3}$

Which list shows the results in order from least to greatest?

A 60%, $\frac{2}{3}$, 0.75, $\frac{4}{5}$

B 60%, 0.75, $\frac{2}{3}$, $\frac{4}{5}$

C $\frac{4}{5}$, 0.75, $\frac{2}{3}$, 60%

D $\frac{2}{3}$, $\frac{4}{5}$, 60%, 0.75

---

28 Which statement best describes the change in the perimeter of a triangle if all its side lengths are multiplied by 4?

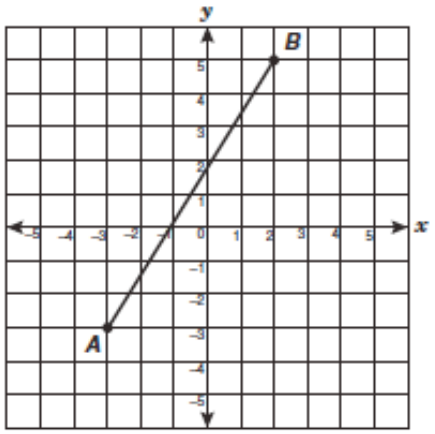
F The new perimeter will be 12 times as large as the perimeter of the original triangle.

G The new perimeter will be 16 times as large as the perimeter of the original triangle.

H The new perimeter will be 4 times as large as the perimeter of the original triangle.

J The new perimeter will be 8 times as large as the perimeter of the original triangle.

29 If $AB = \sqrt{89}$, the length of $\overline{AB}$ is —



A between 43 units and 45 units

B between 88 units and 90 units

C between 8 units and 9 units

D between 9 units and 10 units

30 The expression shown below describes a sequence of numbers.

$$2n + 3$$

If n represents the position of a number in this sequence, which sequence of numbers does this expression describe?

F 5, 8, 11, 14, 17, . . .

G 5, 7, 9, 11, 13, . . .

H 2, 3, 5, 8, 13, 21, . . .

J 2, 5, 8, 11, 14, . . .

31 Jodie wants to buy a shirt regularly priced at $20. The shirt is on sale for 15% off the regular price. Which equation can be used to determine s, the sale price of the shirt, not including tax?

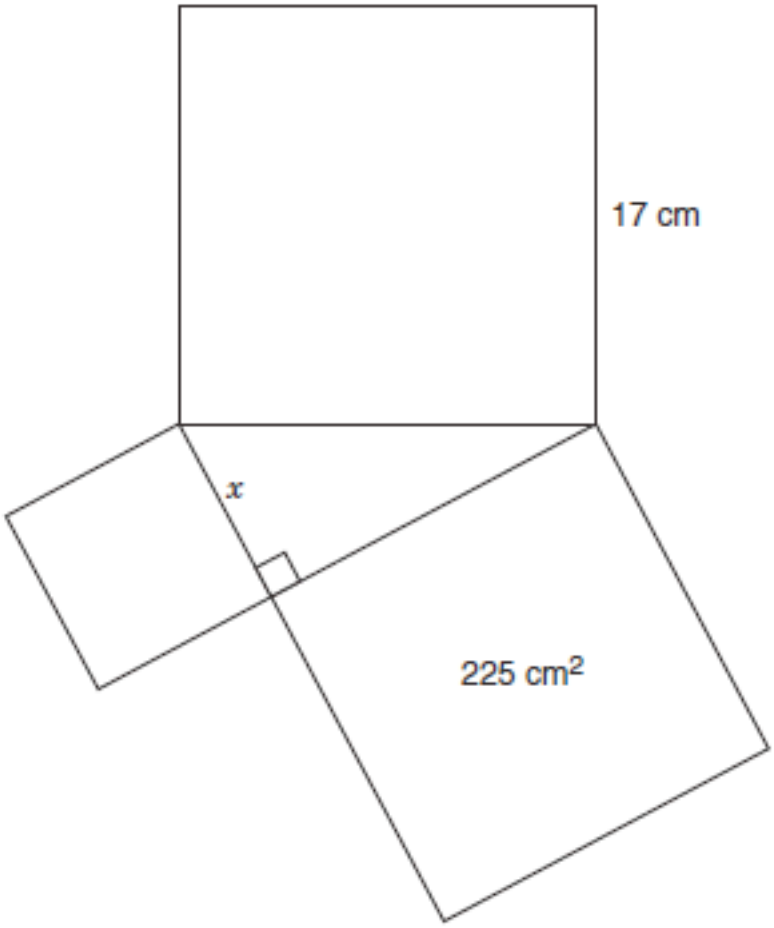
A $s = 20 - (20)(0.15)$

B $s = 20 - (20 + 0.15)$

C $s = 20(0.15)$

D $s = 20 + 0.15$

32 The right triangle shown below is formed by joining three squares at their vertices.



What is the value of x, the side length of the smallest square?

F 16 cm

G 8 cm

H 2 cm

J 32 cm

33 Mr. Reyna spent the afternoon bird-watching at the coast. The table below shows the number of each type of bird he saw.

Coastal Birds

Bird Type	Number of Birds
Great blue heron	2
Roseate spoonbill	80
Brown pelican	40
Herring gull	128

Based on the information in the table, which of these is NOT a valid conclusion?

A Mr. Reyna saw twice as many roseate spoonbills as brown pelicans.

B Of the birds Mr. Reyna saw, 2% were great blue herons.

C Mr. Reyna saw 20 times as many brown pelicans as great blue herons.

D More than half the birds Mr. Reyna saw were herring gulls.

---

34 Mrs. Jackson bought 8 pounds of potatoes for $3.92. Which of the following represents the same price per pound?

F 10 pounds of potatoes for $4.70

G 25 pounds of potatoes for $11.25

H 5 pounds of potatoes for $2.45

J 20 pounds of potatoes for $9.60

35 The cost of renting video games at two different video stores is listed below.

- Best Videos: $2 per video game plus a $30 membership fee
- Quality Videos: $5 per video game and no membership fee

For what number of video games is the cost of renting from either store the same?

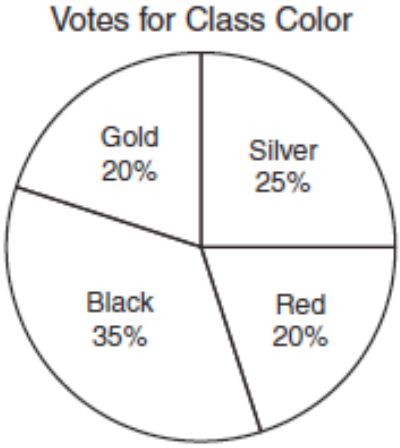
A 10

B 12

C 6

D 15

36 There were 200 students who voted for a class color. The results are shown in the graph below.



Based on the information in the graph, which table represents the actual number of votes for each color?

F

Votes for Class Color

Color	Number of Votes
Silver	25
Red	20
Black	35
Gold	20

H

Votes for Class Color

Color	Number of Votes
Silver	40
Red	50
Black	60
Gold	50

G

Votes for Class Color

Color	Number of Votes
Silver	90
Red	72
Black	126
Gold	72

J

Votes for Class Color

Color	Number of Votes
Silver	50
Red	40
Black	70
Gold	40

37 Alyssa rakes leaves for her neighbors. She charges $4.00 per hour to rake leaves plus $7.00 to remove the leaves. She uses the equation below to calculate t, her total earnings based on h, the number of hours she works.

$$t = 7 + 4h$$

How much will Alyssa earn if she works for 3 hours 15 minutes?

A $23.00

B $34.65

C $20.00

D $35.75

38 Mr. Reynolds wants to determine the number of bags of fertilizer he should buy in order to completely cover his yard. Which of the following methods can he use to find the number of bags of fertilizer he needs?

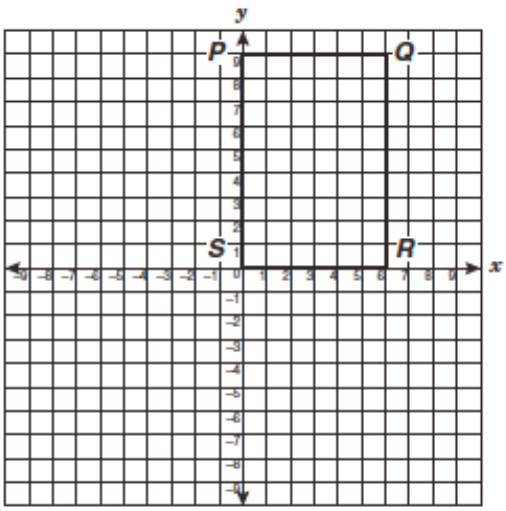
F Multiply the area of the yard by the area each bag of fertilizer can cover

G Divide the area of the yard by the area each bag of fertilizer can cover

H Multiply the area of the yard by the cost of each bag of fertilizer

J Divide the area of the yard by the weight of each bag of fertilizer

39 With the origin as the center of dilation, rectangle $PQRS$ will be dilated by a scale factor of $\frac{1}{3}$ to form rectangle $P'Q'R'S'$.



What will be the length of $\overline{P'S'}$?

A 3 units

B 2 units

C 27 units

D 18 units

---

40 Four people plan to drive an equal amount of time during a 16-hour car trip. The first driver accidentally drives 15% longer than he should have. If the other three people evenly divide the remaining driving time, how long will each of the three people drive?

F 4.6 hours

G 3.8 hours

H 4 hours

J 5 hours

41 The cars in a parade are passing Marisol at a rate of 2 cars per minute. If it takes 18 minutes for all the cars to pass by Marisol, which equation can she use to determine c, the number of cars in the parade?

A $c = \frac{18}{2}$

B $c = 18\left(\frac{60}{2}\right)$

C $c = 2\left(\frac{18}{60}\right)$

D $c = 2(18)$

42 Which equation best represents the relationship between x and y in the table below?

x	y
8	1
12	3
18	6
20	7

F $y = \frac{1}{2}x - 3$

G $y = \frac{1}{2}x - 6$

H $x = 2y - 6$

J $x = 2y - 3$

43 Tim recorded that 27 out of 63 customers used a shopping cart at a grocery store. Based on these results, about how many customers out of 350 can be expected to use a shopping cart?

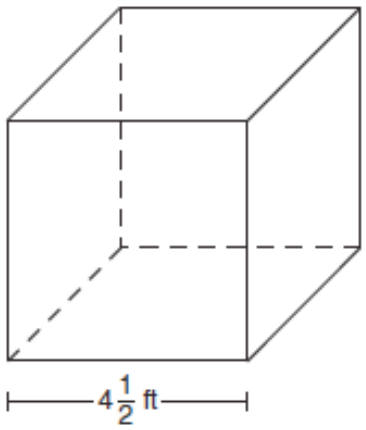
A 110

B 260

C 90

D 150

44 A cube is shown below.



What is the total surface area of this cube?

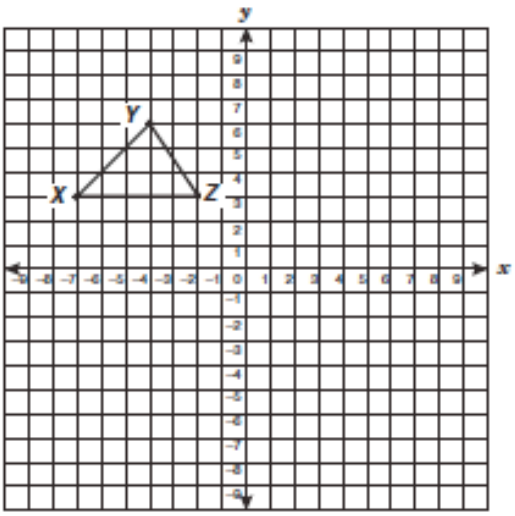
F $91\frac{1}{8}$ ft^2

G $20\frac{1}{4}$ ft^2

H $121\frac{1}{2}$ ft^2

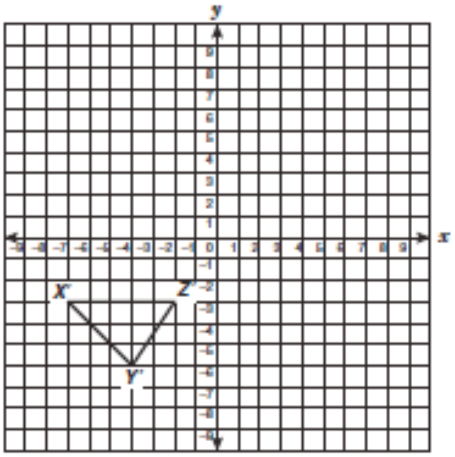
J $101\frac{1}{4}$ ft^2

45 The vertices of triangle XYZ are X (–7, 3), Y (–4, 6), and Z (–2, 3).

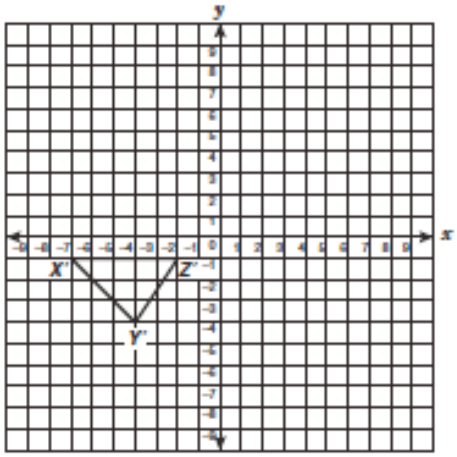


If triangle XYZ is reflected across the y-axis, which graph best represents triangle $X'Y'Z'$?

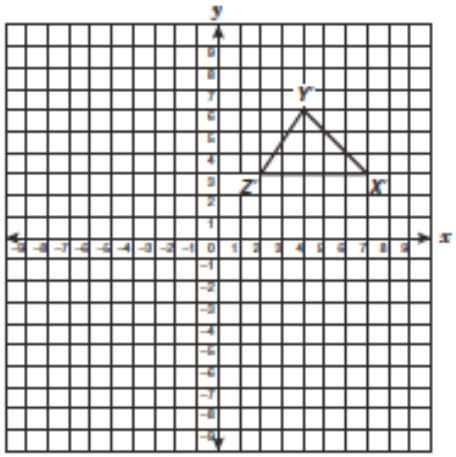
A



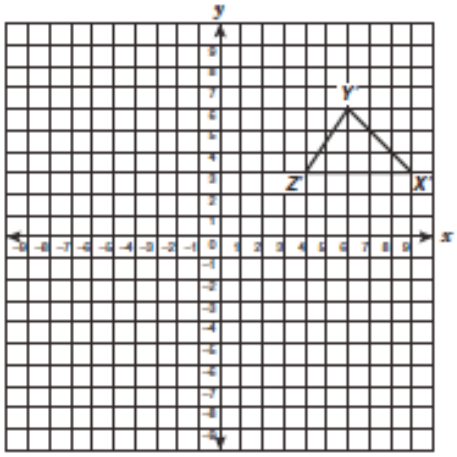
C



B



D



46 One Saturday Haley asked all the people leaving a jogging trail whether they run on a regular basis. Of the 378 people she asked, 347 said yes. Haley concluded that nearly all the people in her city run on a regular basis. What is the best explanation of why her conclusion might NOT be valid?

F The sample size was not large enough.

G Haley should have randomly selected people leaving the jogging trail.

H Haley did not ask how long each person ran.

J The sample may not have been representative of all the people in the city.

47 Louise wants to buy some socks. The packages of socks she could buy are listed below.

- 4 pairs of socks for $12.64
- 6 pairs of socks for $18.00

Louise concludes that the package containing 6 pairs of socks is a better price. Which statement best describes her conclusion?

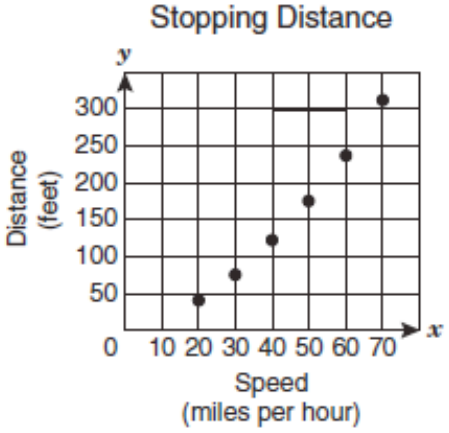
A Louise is correct because the package of 6 pairs costs exactly $0.16 less per pair.

B Louise is incorrect because the package of 4 pairs costs exactly $0.16 less per pair.

C Louise is correct because the package of 6 pairs costs exactly $0.08 less per pair.

D Louise is incorrect because the package of 4 pairs costs exactly $0.08 less per pair.

48 The graph below shows the stopping distance for a certain car, depending on the speed of the car when the brakes were applied.



If the car needed 210 feet to stop, approximately how fast was the car traveling?

F Between 40 and 50 miles per hour

G Between 50 and 60 miles per hour

H Between 60 and 70 miles per hour

J Between 70 and 80 miles per hour

49 A cookie recipe requires 2 pounds of butter to make 18 dozen cookies. If a baker wants to make only 3 dozen cookies, which proportion can he use to find b, the number of pounds of butter he needs?

A $\frac{2}{18} = \frac{b}{3}$

B $\frac{5}{18} = \frac{b}{3}$

C $\frac{2}{18} = \frac{3}{b}$

D $\frac{3}{18} = \frac{2}{b}$

50 Frank plans to make a display by stacking cans. The top 3 rows are shown below.

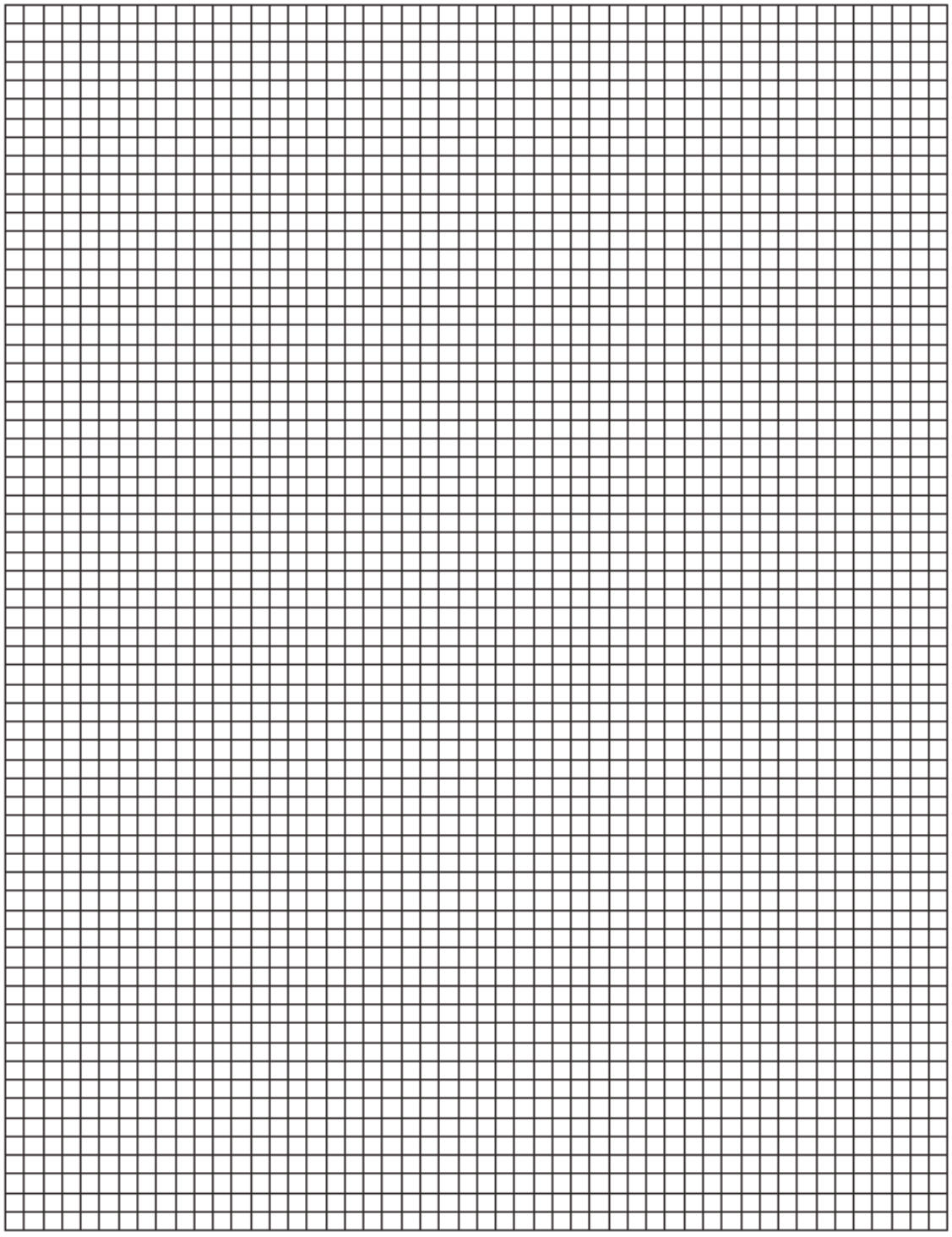
The display will be a total of 7 rows high. How many cans in all will Frank need to make the display?

F 49

G 28

H 7

J 22



Texas Assessment of Knowledge and Skills - Answer Key

Grade: 08
Subject: Mathematics
Administration: April 2009

Item Number	Correct Answer	Objective Measured	Student Expectations
01	D	05	8.13 (B)
02	F	01	8.2 (C)
03	C	06	8.14 (C)
04	H	03	8.6 (B)
05	B	06	8.16 (B)
06	F	01	8.2 (A)
07	D	04	8.9 (B)
08	J	02	8.5 (B)
09	C	05	8.12 (A)
10	G	06	8.16 (A)
11	D	03	8.7 (B)
12	H	01	8.1 (A)
13	B	06	8.14 (A)
14	F	05	8.11 (A)
15	D	02	8.3 (B)
16	G	03	8.7 (D)
17	C	02	8.3 (A)
18	J	05	8.12 (B)
19	18.75	01	8.2 (B)
20	J	03	8.7 (A)
21	A	04	8.8 (C)
22	G	01	8.1 (D)
23	D	02	8.4 (A)
24	H	04	8.9 (A)
25	B	02	8.3 (B)
26	H	06	8.16 (A)
27	A	01	8.1 (A)
28	H	04	8.10 (A)
29	D	01	8.1 (C)
30	G	02	8.5 (B)
31	A	01	8.2 (A)
32	G	03	8.7 (C)
33	B	05	8.13 (B)
34	H	02	8.3 (A)
35	A	06	8.14 (B)
36	J	05	8.12 (C)
37	C	02	8.5 (A)
38	G	06	8.15 (A)
39	A	03	8.6 (A)
40	G	06	8.14 (A)
41	D	01	8.2 (D)
42	F	02	8.4 (A)
43	D	05	8.11 (B)
44	H	04	8.8 (A)
45	B	03	8.6 (B)
46	J	05	8.13 (A)
47	A	06	8.16 (B)
48	G	02	8.5 (A)
49	A	01	8.1 (B)
50	G	06	8.14 (C)

Appendix B

Permission Letter from MacArthur Ninth Grade School

"Reaching for New Heights"

CRAIG MULLENIX, PRINCIPAL
D'ANN DELGADO ASSISTANT PRINCIPAL for INSTRUCTION
THOMAS CHARLES, ASSISTANT PRINCIPAL
JAIME GUERRA, ASSISTANT PRINCIPAL

January 14, 2010

Dr. Craig Mullenix, Principal
MacArthur Ninth Grade School
12111 Gloger Road
Houston, TX 77039

Dear Human Subjects Committee:

It is my understanding that Mr. Federico Hernandez will be conducting a research study at MacArthur Ninth Grade School on "The Relationship Between Reading Achievement and Mathematics Achievement for Urban Eighth Grade Students". Mr. Hernandez has informed me of the design of the study as well as the targeted population.

I support this effort and will provide any assistance necessary for the successful implementation of this study. If you have any questions, please do not hesitate to call. I can be reached at (281) 985-7400.

Sincerely,

Dr. Craig Mullenix, Principal
MacArthur Ninth Grade School

Appendix C

Correlation results from the Pearson product-moment correlation technique

Descriptive Statistics

	Mean	Std. Deviation	N
ReadingCommended6	2495.20	121.013	325
MathCommended6	2434.84	201.529	325

Correlations

		ReadingCommended6	MathCommended6
ReadingCommended6	Pearson Correlation	1	.347**
	Sig. (2-tailed)		.000
	N	325	325
MathCommended6	Pearson Correlation	.347**	1
	Sig. (2-tailed)	.000	
	N	325	325

**. Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
ReadingMetStandard6	2248.80	66.927	291
MathMetStandard6	2268.29	186.747	291

Correlations

		ReadingMetStandard6	MathMetStandard6
ReadingMetStandard6	Pearson Correlation	1	.178**
	Sig. (2-tailed)		.002
	N	291	291
MathMetStandard6	Pearson Correlation	.178**	1
	Sig. (2-tailed)	.002	
	N	291	291

**. Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
ReadingDidNotMeetStandard6	1737.81	427.588	36
MathDidNotMeetStandard6	2062.28	277.932	36

Correlations

		ReadingDidNotMeetStandard6	MathDidNotMeetStandard6
ReadingDidNotMeetStandard6	Pearson Correlation	1	.113
	Sig. (2-tailed)		.514
	N	36	36
MathDidNotMeetStandard6	Pearson Correlation	.113	1
	Sig. (2-tailed)	.514	
	N	36	36

Descriptive Statistics

	Mean	Std. Deviation	N
ReadingCommended7	2471.33	95.105	168
MathCommended7	2382.58	162.435	168

Correlations

		ReadingCommended7	MathCommended7
ReadingCommended7	Pearson Correlation	1	.317**
	Sig. (2-tailed)		.000
	N	168	168
MathCommended7	Pearson Correlation	.317**	1
	Sig. (2-tailed)	.000	
	N	168	168

**. Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
ReadingMetStandard7	2223.33	70.647	431
MathMetStandard7	2254.36	140.077	431

Correlations

		ReadingMetStandard7	MathMetStandard7
ReadingMetStandard7	Pearson Correlation	1	.341**
	Sig. (2-tailed)		.000
	N	431	431
MathMetStandard7	Pearson Correlation	.341**	1
	Sig. (2-tailed)	.000	
	N	431	431

**. Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
ReadingDidNotMeetStandard7	2,009.13	62.429	53
MathDidNotMeetStandard7	2113.64	128.813	53

Correlations

		ReadingDidNotMeetStandard7	MathDidNotMeetStandard7
ReadingDidNotMeetStandard7	Pearson Correlation	1	.325*
	Sig. (2-tailed)		.018
	N	53	53
MathDidNotMeetStandard7	Pearson Correlation	.325*	1
	Sig. (2-tailed)	.018	
	N	53	53

*. Correlation is significant at the 0.05 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
ReadingCommended8	2520.80	116.714	296
MathCommended8	2354.11	189.198	296

Correlations

		ReadingCommended8	MathCommended8
ReadingCommended8	Pearson Correlation	1	.202**
	Sig. (2-tailed)		.000
	N	296	296
MathCommended8	Pearson Correlation	.202**	1
	Sig. (2-tailed)	.000	
	N	296	296

**. Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
ReadingMetStandard8	2261.87	71.725	334
MathMetStandard8	2236.49	168.114	334

Correlations

		ReadingMetStandard8	MathMetStandard8
ReadingMetStandard8	Pearson Correlation	1	.284**
	Sig. (2-tailed)		.000
	N	334	334
MathMetStandard8	Pearson Correlation	.284**	1
	Sig. (2-tailed)	.000	
	N	334	334

**. Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
ReadingDidNotMeetStandard8	1981.00	190.053	22
MathDidNotMeetStandard8	2160.32	104.395	22

Correlations

		ReadingDidNotMeetStandard8	MathDidNotMeetStandard8
ReadingDidNotMeetStandard8	Pearson Correlation	1	-.165
	Sig. (2-tailed)		.463
	N	22	22
MathDidNotMeetStandard8	Pearson Correlation	-.165	1
	Sig. (2-tailed)	.463	
	N	22	22

Descriptive Statistics

	Mean	Std. Deviation	N
Reading6	2343.4080	234.30557	652
Math6	2339.94	225.735	652

Correlations

		Reading6	Math6
Reading6	Pearson Correlation	1	.481**
	Sig. (2-tailed)		.000
	N	652	652
Math6	Pearson Correlation	.481**	1
	Sig. (2-tailed)	.000	
	N	652	652

**. Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
Reading7	2269.8206	152.87411	652
Math7	2275.9617	162.61027	652

Correlations

		Reading7	Math7
Reading7	Pearson Correlation	1	.537**
	Sig. (2-tailed)		.000
	N	652	652
Math7	Pearson Correlation	.537**	1
	Sig. (2-tailed)	.000	
	N	652	652

**. Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
Reading8	2369.9448	177.26194	652
Math8	2287.3160	186.89178	652

Correlations

		Reading8	Math8
Reading8	Pearson Correlation	1	.385**
	Sig. (2-tailed)		.000
	N	652	652
Math8	Pearson Correlation	.385**	1
	Sig. (2-tailed)	.000	
	N	652	652

**. Correlation is significant at the 0.01 level (2-tailed).