The exam you are interested in taking is designed to test your proficiency in the relevant subject matter. You should be thoroughly familiar with the subject matter before you attempt to take the exam. This EA/CBE Study Guide can help you prepare for the exam by giving you an idea of what you need to review. You can check your familiarity level by reviewing the Texas Essential Knowledge and Skills (TEKS) for this course (see below). To refine your skills, you can refer to any of the state-adopted textbooks.

Texas Essential Knowledge and Skills (TEKS)
Every question that appears on this exam is derived from the knowledge and skills statements and student expectations within the Texas-mandated standards, the Texas Essential Knowledge and Skills (TEKS). You can view the TEKS for this exam online via the following link: http://ritter.tea.state.tx.us/rules/tac/chapter111/ch111b.html - 111.27. Refer to section (b), Knowledge and skills, 1A–13F.

Throughout this guide, you’ll see TEKS references. These refer to the numbers listed under (c) Knowledge and skills; for example, 1A or 3B.

Materials Needed
You will need to bring a scientific calculator. The formula sheets at the end of this study guide will be provided during the exam. You can also bring these formula sheets with you to your exam. If you are taking a print exam, you must bring a #2 pencil to complete the exam. You will receive a computer-graded answer sheet when you arrive at the testing center. The proctor will provide scratch paper.

Exam Structure
You will be allowed 3 hours to complete this exam. The exam consists of 66 multiple-choice questions that are equally weighted. You will be allowed one short, monitored breaks during the exam. The exam covers the following 6 Objectives:

Objective 1: Mathematical Process Standards
Objective 2: Numbers and Operations (5 questions)
Objective 3: Proportionality (30 questions)
Objective 4: Expressions, Equations, and Relationships (17 questions)
Objective 5: Measurement and Data (5 questions)
Objective 6: Personal Financial Literacy (9 questions)
Scholastic Honesty
When you arrive at the testing center, you will be asked to carefully read the exam rules and sign a statement agreeing to take the exam in accordance with the rules. This is called the Examinee’s Certification. The following is a copy of these rules:

Examinee’s Certification
This certification must be signed before the exam is administered and then returned with the completed examination attached, or credit for the exam will not be given.

Scholastic dishonesty is a serious academic violation that will not be tolerated. Scholastic dishonesty encompasses, but is not limited to:

- copying from another student’s work;
- using an unauthorized testing proctor or taking the exam at an unauthorized testing location;
- using materials not authorized by a testing proctor;
- possessing materials that are not authorized by a testing proctor, such as lessons, books, or notes;
- knowingly using or soliciting, in whole or part, the contents of an unadministered test;
- collaborating with or seeking aid from another student without authorization during the test;
- substituting for another person, or permitting another person to substitute for oneself, in taking a course test or completing any course-related assignment;
- using, buying, stealing, or transporting some or all of the contents of an unadministered test, test rubric, homework answer, or computer program.

Evidence of scholastic dishonesty will result in a grade of F on the examination and an F in the course (if applicable).

At the testing center, you will be asked to sign a statement that says you have read the above and agree to complete the examination with scholastic honesty.
**General Study Tips**
The bulleted lists and sample questions in this study guide can assist you in preparing for the exam. It is a fairly complete guide, but does not cover every item on the test. Ultimately, you should use the TEKS to guide your exam preparation.

**Additional Study Tips**
The following information provides direction for your studies. For each part, you will find study tips and sample questions to give you a general idea of the types of questions you can expect to see on the exam.

**Objective 1: Mathematical Process Standards**
This part relates to your knowledge of using mathematical processes to acquire and demonstrate mathematical understanding.

**Study Tips for Objective 1**
This part relates to TEKS 1A–G**. Familiarize yourself with those TEKS, and then be prepared to demonstrate knowledge of the following topics:

- Apply mathematics to problems arising in everyday life, society, and the workplace.
- Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
- Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
- Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.
- Create and use representations to organize, record, and communicate mathematical ideas.
- Analyze mathematical relationships to connect and communicate mathematical ideas.
- Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

**These TEKS are incorporated into other test questions, therefore there are no sample questions on this study guide.**
Objective 2: Numbers and Operations
This part relates to your knowledge of representing and using rational numbers in a variety of forms.

Study Tips for Objective 2
This part relates to TEKS 2–3B. Familiarize yourself with those TEKS, and then be prepared to demonstrate knowledge of the following topics:

- Extend previous knowledge of sets and subsets using visual representation to describe relationships between sets of rational numbers.
- Add, subtract, multiply, and divide rational numbers fluently.
- Apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers.

Sample Questions for Objective 2
The following are sample questions. You can find the correct answers listed at the end of this study guide, but try answering the questions without looking at the answers first to check your comprehension.

DIRECTIONS: Select the BEST response to each of the following questions.

1. A recipe that yields 2.5 dozen muffins requires 1.25 cups of flour. Mandy wants to make 10 dozen muffins. How many cups of flour will she need?

   A. 2.5 cups  
   B. 5.0 cups  
   C. 10 cups  
   D. 20 cups
**Objective 3: Proportionality**
This part relates to your knowledge of how to represent and solve problems involving proportional relationships.

**Study Tips for Objective 3**
This part relates to TEKS 4A–6I. Familiarize yourself with those TEKS, and then be prepared to demonstrate knowledge of the following topics:

- Represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including \( d = rt \).
- Calculate unit rates from rates in mathematical and real-world problems.
- Determine the constant of proportionality \( k = \frac{y}{x} \) within mathematical and real-world problems.
- Solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems.
- Convert between measurement systems, including the use of proportions and the use of unit rates.
- Generalize the critical attributes of similarity, including ratios within and between similar shapes.
- Describe \( \pi \) as the ratio of the circumference of a circle to its diameter.
- Solve mathematical and real-world problems involving similar shape and scale drawings.
- Represent sample spaces for simple and compound events using lists and tree diagrams.
- Select and use different simulations to represent simple and compound events with and without technology.
- Make predictions and determine solutions using experimental data for simple and compound events.
- Make predictions and determine solutions using theoretical probability for simple and compound events.
- Find the probabilities of a simple event and its complement and describe the relationship between the two.
- Use data from a random sample to make inferences about a population.
- Solve problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents.
- Solve problems using qualitative and quantitative predictions and comparisons from simple experiments.
- Determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces.
Sample Questions for Objective 3
The following are sample questions. You can find the correct answers listed at the end of this study guide, but try answering the questions without looking at the answers first to check your comprehension.

DIRECTIONS: Select the BEST response to each of the following questions.

2. The local resale store buys used designer jeans for $15. The store increases their purchase price by 400%. What is the sale price of the designer jeans?
   A. $60  
   B. $75  
   C. $125  
   D. $600

3. If the rectangle below is enlarged using a scale factor of 2.5, what would be the area of the new rectangle?

   8 in.
   4 in.

   A. 64 in$^2$  
   B. 80 in$^2$  
   C. 160 in$^2$  
   D. 200 in$^2$
4. A survey asks students “How many hours a day do you watch TV?” The results are shown in the dot plot below.

**How many hours a day do you watch TV?**

What percentage of students watch at least 3 hours of TV per day?

A. 25%
B. 50%
C. 75%
D. 100%

5. Allison had two coins. She flipped the first coin, then flipped the second coin. What is the probability of getting a head, then another head?

A. \( P(TT) = \frac{1}{2} \)
B. \( P(TT) = \frac{1}{4} \)
C. \( P(TT) = \frac{1}{25} \)
D. \( P(TT) = \frac{1}{50} \)
Objective 4: Expressions, Equations, and Relationships
This part relates to your knowledge of geometry and linear relationships using multiple representations.

Study Tips for Objective 4
This part relates to TEKS 7–11C. Familiarize yourself with those TEKS, and then be prepared to demonstrate knowledge of the following topics:

- Represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$.
- Model the relationship between the volume of a rectangular prism and a rectangular pyramid having both congruent bases and heights and connect that relationship to the formulas.
- Explain verbally and symbolically the relationship between the volume of a triangular prism and a triangular pyramid having both congruent bases and heights and connect that relationship to the formulas.
- Use models to determine the approximate formulas for the circumference and area of a circle and connect the models to the actual formulas.
- Solve problems involving the volume of rectangular prisms, triangular prisms, rectangular pyramids, and triangular pyramids.
- Determine the circumference and area of circles.
- Determine the area of composite figures containing combinations of rectangles, squares, parallelograms, trapezoids, triangles, semicircles, and quarter circles.
- Solve problems involving the lateral and total surface area of a rectangular prism, rectangular pyramid, triangular prism, and triangular pyramid by determining the area of the shape’s net.
- Write one-variable, two-step equations and inequalities to represent constraints or conditions within problems.
- Represent solutions for one-variable, two-step equations and inequalities on number lines.
- Write a corresponding real-world problem given a one-variable, two-step equation or inequality.
- Model and solve one-variable, two-step equations and inequalities.
- Determine if the given value(s) make(s) one-variable, two-step equations and inequalities true.
- Write and solve equations using geometry concepts, including the sum of the angles in a triangle, and angle relationships.
Sample Questions for Objective 4
The following are sample questions. You can find the correct answers listed at the end of this study guide, but try answering the questions without looking at the answers first to check your comprehension.

DIRECTIONS: Select the BEST response to each of the following questions.

6. Given the following equation, write a scenario that would lead to writing the equation.

\[2r + 15 = 25\]

A. You are going to the movies with some friends. You have $25 to spend. The movie costs $15 and each item at the concession stand costs $2. This equation shows how many items you can buy at the concession stand.
B. You are going to the movies with some friends. You have $25 to spend. The movie costs $2 and each item at the concession stand costs $15. This equation shows how many items you can buy at the concession stand.
C. You are going to the movies with some friends. You have at least $25 to spend. The movie costs $15 and each item at the concession stand costs $2. This equation shows how many items you can buy at the concession stand.
D. You are going to the movies with some friends. You have no more than $25 to spend. The movie costs $15 and each item at the concession stand costs $2. This equation shows how many items you can buy at the concession stand.

7. \(\angle A\) and \(\angle B\) are supplementary. \(\angle A\) is 39°, so \(\angle B\) must be _____.

A. 51°
B. 141°
C. 151°
D. 41°

8. Ronan has twenty dollars to spend on his cab fare. There is a $3 initial fare and an additional $2.15 per mile. Write an inequality to represent how far Ronan can travel if he can’t spend over fifteen dollars on cab fare.

A. 3x+2.15 > 15
B. 3x+2.15 < 15
C. 3+2.15x > 15
D. 3+2.15x < 15
**Objective 5: Measurement and Data**
This part relates to your knowledge of using statistical representations to analyze data.

**Study Tips for Objective 5**
This part relates to TEKS 12A–C. Familiarize yourself with those TEKS, and then be prepared to demonstrate knowledge of the following topics:

- Compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads.
- Use data from a random sample to make inferences about a population.
- Compare two populations based on data in random samples from these populations, including informal comparative inferences about difference between two populations.

**Sample Questions for Objective 5**
The following are sample questions. You can find the correct answers listed at the end of this study guide, but try answering the questions without looking at the answers first to check your comprehension.

**DIRECTIONS:** Select the BEST response to each of the following questions.

9. Below is the data collected from two random samples of 100 teenagers regarding the sport they prefer to play. What inference can you make from the data?

<table>
<thead>
<tr>
<th>Sample</th>
<th>Soccer</th>
<th>Basketball</th>
<th>Football</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>24</td>
<td>20</td>
<td>56</td>
<td>100</td>
</tr>
<tr>
<td>#2</td>
<td>20</td>
<td>28</td>
<td>52</td>
<td>100</td>
</tr>
</tbody>
</table>

A. Most students prefer soccer.
B. Most students hate basketball.
C. Most students prefer basketball to football.
D. Most students prefer football than soccer and basketball combined.
Objective 6: Personal Financial Literacy
This part relates to your knowledge developing an economic way of thinking and problem solving using your knowledge of both a consumer and investor.

Study Tips for Objective 6
This part relates to TEKS 13A–F. Familiarize yourself with those TEKS, and then be prepared to demonstrate knowledge of the following topics:

- Calculate the sales tax for a given purchase and calculate income tax for earned wages.
- Identify the components of a personal budget, including income; planned savings for college, retirement, and emergencies; and fixed and variable expenses, and calculate what percentage of each category comprises of the total budget.
- Create and organize a financial assets and liabilities record and construct a net worth statement.
- Use a family budget estimator to determine the minimum household budget and average hourly wage needed for a family to meet its basic needs in the student’s city or another large city nearby.
- Calculate and compare simple interest and compound interest earnings.
- Analyze and compare monetary incentives, including sales, rebates and coupons.

Sample Questions for Objective 6
The following are sample questions. You can find the correct answers listed at the end of this study guide, but try answering the questions without looking at the answers first to check your comprehension.

DIRECTIONS: Select the BEST response to each of the following questions.

10. The Hernandez family went out to dinner and spent $56.82. The sales tax was 6.83%. What was the sales tax added to the total bill?

   A. $3.88  
   B. $38.80  
   C. $60.70  
   D. $95.62

11. Brian earns $1875 monthly. Of that, he pays $240.00 in bills. Approximately what percent of Brian’s earnings are left after he pays his bills?

   A. 12%  
   B. 22%  
   C. 65%  
   D. 88%
# Answer Key

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Correct Answer</th>
<th>TEKS expectation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B</td>
<td>3A</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>4D</td>
</tr>
<tr>
<td>3</td>
<td>D</td>
<td>5C</td>
</tr>
<tr>
<td>4</td>
<td>B</td>
<td>6G</td>
</tr>
<tr>
<td>5</td>
<td>B</td>
<td>6D</td>
</tr>
<tr>
<td>6</td>
<td>A</td>
<td>10C</td>
</tr>
<tr>
<td>7</td>
<td>B</td>
<td>11C</td>
</tr>
<tr>
<td>8</td>
<td>D</td>
<td>10A</td>
</tr>
<tr>
<td>9</td>
<td>D</td>
<td>12C</td>
</tr>
<tr>
<td>10</td>
<td>A</td>
<td>13A</td>
</tr>
<tr>
<td>11</td>
<td>D</td>
<td>13B</td>
</tr>
</tbody>
</table>
# 7th Grade Mathematics

**Formula Sheet**

## Length

<table>
<thead>
<tr>
<th>Customary</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mile (mi) = 1,760 yards (yd)</td>
<td>1 kilometer (km) = 1,000 meters (m)</td>
</tr>
<tr>
<td>1 yard (yd) = 3 feet (ft)</td>
<td>1 meter (m) = 100 centimeters (cm)</td>
</tr>
<tr>
<td>1 foot (ft) = 12 inches (in)</td>
<td>1 centimeters (cm) = 10 millimeters (mm)</td>
</tr>
</tbody>
</table>

## Volume

<table>
<thead>
<tr>
<th>Customary</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 gallon (gal) = 4 quarts (qt)</td>
<td>1 liter (L) = 1,000 milliliters (mL)</td>
</tr>
<tr>
<td>1 quart (qt) = 2 pints (pt)</td>
<td></td>
</tr>
<tr>
<td>1 pint (pt) = 2 cups (c)</td>
<td></td>
</tr>
<tr>
<td>1 cup (c) = 8 fluid ounces (fl oz)</td>
<td></td>
</tr>
</tbody>
</table>

## Weight and Mass

<table>
<thead>
<tr>
<th>Customary</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ton (T) = 2,000 pounds (lb)</td>
<td>1 kilogram (kg) = 1,000 grams (g)</td>
</tr>
<tr>
<td>1 pound (lb) = 16 ounces (oz)</td>
<td>1 gram (g) = 1,000 milligrams (mg)</td>
</tr>
</tbody>
</table>

## Time

- 1 year = 12 months
- 1 year = 52 weeks
- 1 week = 7 days
- 1 day = 24 hours
- 1 hour = 60 minutes
- 1 minute = 60 seconds
# 7th Grade Mathematics
## Formula Sheet

### Perimeter

<table>
<thead>
<tr>
<th>Shape</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangle</td>
<td>$P = 2l + 2w$</td>
</tr>
</tbody>
</table>

### Circumference

<table>
<thead>
<tr>
<th>Shape</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circle</td>
<td>$C = 2\pi r$ or $C = \pi d$</td>
</tr>
</tbody>
</table>

### Area

<table>
<thead>
<tr>
<th>Shape</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangle</td>
<td>$A = \frac{1}{2} bh$</td>
</tr>
<tr>
<td>Rectangle or parallelogram</td>
<td>$A = bh$</td>
</tr>
<tr>
<td>Trapezoid</td>
<td>$A = \frac{1}{2} (b_1 + b_2)h$</td>
</tr>
<tr>
<td>Circle</td>
<td>$A = \pi r^2$</td>
</tr>
</tbody>
</table>

### Volume

<table>
<thead>
<tr>
<th>Shape</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangular prism</td>
<td>$V = Bh$</td>
</tr>
<tr>
<td>Rectangular prism</td>
<td>$V = Bh$</td>
</tr>
<tr>
<td>Cylinder</td>
<td>$V = \pi r^2 h$ or $V = Bh$</td>
</tr>
</tbody>
</table>

### Additional Information

| Pi                        | $\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$ |

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