

Florida Teacher Certification Examinations
Test Information Guide
for
Middle Grades Mathematics 5–9



FLORIDA DEPARTMENT OF EDUCATION

www.fdoe.org

Fourth Edition

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Test and Test Information Guide Development

Teacher Certification Testing

Since 1980, Florida teacher certification candidates have been required to pass the Florida Teacher Certification Examinations (FTCE), which has consisted of tests in reading, writing, mathematics, and professional knowledge. The 1986 Florida Legislature modified the testing program by also requiring teacher candidates to pass a test in the subject area in which they wish to be certified. In addition, the Legislature substituted the Florida College-Level Academic Skills Test (CLAST) for the reading, writing, and mathematics portions of the FTCE. The 2000 Florida Legislature replaced the CLAST with the General Knowledge Test, effective July 1, 2002.

The subject area knowledge tested on the Middle Grades Mathematics 5–9 examination was identified and validated by committees of content specialists from within the state of Florida. Committee members included public school teachers, district supervisors, and college faculty with expertise in this field. Committee members were selected on the basis of recommendations by district superintendents, public school principals, deans of education, experts in the field, and other organizations. In developing the test, the committees used an extensive literature review, interviews with selected public school teachers, a large-scale survey of teachers, pilot tests, and their own professional judgment.

Role of the Test Information Guide

The purpose of this test information guide is to help candidates taking the subject area test in Middle Grades Mathematics 5–9 prepare effectively for the examination. The guide was designed to familiarize prospective test takers with various aspects of the examination, including the content that is covered and the way it is represented. The guide should enable candidates to direct their study and to focus on relevant material for review.

This test information guide is intended primarily for use by certification candidates, who may be students in a college or university teacher-preparation program, teachers with provisional certification, teachers seeking certification in an additional subject area, or persons making a career change to public school teaching. Candidates may have studied and worked in Florida or may be from out of state.

College or university faculty may also use the guide to prepare students for certification, and inservice trainers may find the guide useful for helping previously certified teachers prepare for recertification or multiple certification.

This test information guide is not intended as an all-inclusive source of subject area knowledge, nor is it a substitute for college course work in the subject area. The sample questions are representative of the content of the actual test; however, they are not actual test questions from an actual test form. Instead, the guide is intended to help candidates prepare for the subject area test by presenting an overview of the content and format of the examination.

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Preparation for the Test

The following outline may help you to prepare for the examination. Adapt these suggestions to suit your own study habits and the time you have available for review.

Overview

- **Look over the organization of the test information guide.**

Section 1 discusses the development of the test and test information guide.

Section 2 (this section) outlines test preparation steps.

Section 3 offers strategies for taking the test.

Section 4 presents information about the content and structure of the test.

Section 5 lists question formats and includes sample test questions.

Section 6 provides an annotated bibliography of general references you may find useful in your review.

Section 7 identifies a source of further information.

Self-Assessment

- **Decide which content areas you should review.**

Section 4 includes the competencies and skills used to develop this subject area test and the approximate proportion of test questions from each competency area.

Review

- **Study according to your needs.**

Review all of the competencies and concentrate on areas with which you are least familiar.

Practice

- **Acquaint yourself with the format of the examination.**

Section 5 describes types of questions you may find on the examination.

- **Answer sample test questions.**

Section 5 gives you an opportunity to test yourself with sample test questions and provides an answer key and information regarding the competency to which each question is linked.

Final preparation

- **Review test-taking advice.**

Section 3 includes suggestions for improving your performance on the examination.

- **Refer to field-specific references.**

Section 6 includes an annotated bibliography listing general references keyed to the competencies and skills used to develop this subject area test.



Test-Taking Advice

- Go into the examination prepared, alert, and well rested.
- Complete your travel arrangements prior to the examination date. Plan to arrive early so that you can locate the parking facilities and examination room without rushing.
- Dress comfortably and bring a sweater or jacket in case the room is too cool.
- Take the following with you to the test site:
 - Admission ticket
 - Proper identification as described in "Identification Policy"
 - Watch
- There are many strategies for taking a test and different techniques for dealing with different types of questions. Nevertheless, you may find the following general suggestions useful.
 - Read each question and all the response options carefully before selecting your answer. Pay attention to all of the details.
 - Go through the entire test once and answer all the questions you are reasonably certain about. Then go back and tackle the questions that require more thought.
 - When you are not certain of the right answer, eliminate as many options as you can and choose the response that seems best. It is to your advantage to answer all the questions on the test, even if you are uncertain about some of your choices.
 - After completing the examination, go back and check every question. Verify that you have answered all of the questions and that your responses are correctly entered.



4

Competencies and Skills and Test Blueprint

The table on the following pages lists the competencies and skills used as the basis for the Middle Grades Mathematics 5–9 examination. These competencies and skills represent the knowledge that teams of teachers, subject area specialists, and district-level educators have determined to be important for beginning teachers. This table could serve as a checklist for assessing your familiarity with each of the areas covered by the test. The competencies and skills should help you organize your review. The test blueprint indicates the approximate percentage of test questions that will cover the specific competency on the exam.

Competencies are broad areas of content knowledge.

Skills identify specific behaviors that demonstrate the competencies.

Percentages indicate the approximate proportion of test questions that represent the competencies on the test.

The following excerpt illustrates the components of the table.

*Approximate percentage of total test questions
(test blueprint)*

<i>Competency</i>	Competency/Skill	Approx. %
	1 Knowledge of mathematics through problem solving	4%
	1 Identify appropriate mathematical problems from real-world situations.	
	2 Apply problem-solving strategies to solve nonroutine problems with multiple steps.	
	3 Evaluate the reasonableness of results with respect to the original problem.	
<i>Skills (1-4)</i>	4 Use mathematics to solve problems in other contexts.	

Table of Competencies, Skills, and Approximate Percentages of Questions

Competency/Skill	Approx. %
1 Knowledge of mathematics through problem solving	4%
<ol style="list-style-type: none"> 1 Identify appropriate mathematical problems from real-world situations. 2 Apply problem-solving strategies to solve nonroutine problems with multiple steps. 3 Evaluate the reasonableness of results with respect to the original problem. 4 Use mathematics to solve problems in other contexts. 	
2 Knowledge of mathematical representations	4%
<ol style="list-style-type: none"> 1 Identify appropriate representations or models for mathematics operations or situations using written, concrete, pictorial, graphical, or algebraic methods. 2 Interpret results as illustrated by the use of mathematical representations. 3 Select appropriate manipulatives, mathematical models, or technology for teaching particular mathematics concepts (e.g., tiles for teaching area, graphing calculators for teaching algebra). 	
3 Knowledge of mathematics through reasoning	6%
<ol style="list-style-type: none"> 1 Identify deductive and inductive reasoning. 2 Identify valid mathematical arguments (e.g., an explanation that the sum of two odd numbers is always even). 3 Identify the hypothesis and conclusion, given a conditional statement. 4 Identify the converse, inverse, and contrapositive of a conditional statement. 5 Select logical conclusions from given statements. 	
4 Knowledge of mathematical connections	6%
<ol style="list-style-type: none"> 1 Identify prerequisite skills for a given topic. 2 Identify common misconceptions in mathematics (e.g., area and perimeter). 3 Identify the relationship between mathematical concepts (e.g., repeated addition and multiplication). 4 Identify mathematical errors, including computation, algebraic, data analysis, and geometric errors. 	

Competency/Skill		Approx. %
5	Analyze mathematical errors, including computation, algebraic, data analysis, and geometric errors.	
6	Identify fundamental ideas that connect middle grades mathematics to advanced mathematics (e.g., trigonometry, number theory, precalculus, calculus).	
5	Knowledge of number sense, concepts, and operations	13%
1	Identify elements and subsets of the real number system.	
2	Compare the relative size of real numbers expressed in a variety of forms, including fractions, decimals, percents, and scientific notation.	
3	Identify estimation strategies.	
4	Simplify expressions using the laws of exponents.	
5	Identify equivalent forms of rational exponents and radicals.	
6	Simplify radical expressions.	
7	Determine the prime factorization of composite numbers.	
8	Identify the greatest common factor (GCF) and least common multiple (LCM) of sets of numbers.	
9	Evaluate numerical expressions using order of operations.	
10	Solve real-world problems using proportions.	
11	Solve real-world problems that involve real numbers.	
6	Knowledge of algebraic thinking	25%
1	Predict missing or subsequent terms in numerical, algebraic, and pictorial patterns.	
2	Analyze relationships between tables, graphs, or rules.	
3	Analyze relationships to determine the impact when changing parameters of given functions.	
4	Simplify rational and irrational expressions.	
5	Solve equations or inequalities with one variable, including absolute values.	
6	Identify matrices that represent data provided by real-world or mathematical problems.	
7	Identify graphs of first-degree inequalities involving one variable on a number line.	
8	Identify graphs of linear equations or inequalities involving two variables on the coordinate plane.	

Competency/Skill	Approx. %
<p>9 Identify the slope and intercepts of a graph or an equation.</p> <p>10 Identify the interpretation of the slope and intercepts, given a real-world context.</p> <p>11 Identify the equation of a line that is perpendicular or parallel to a given line.</p> <p>12 Determine an equation of a line.</p> <p>13 Determine the greatest common monomial factor of a polynomial.</p> <p>14 Factor polynomials.</p> <p>15 Solve systems of linear equations involving two variables using graphing, substitution, or elimination.</p> <p>16 Determine the solution set of a system of linear inequalities involving two variables.</p> <p>17 Solve quadratic equations and inequalities by completing the square, the quadratic formula, and factoring.</p> <p>18 Use the discriminant or a graph of a quadratic equation to determine the nature of its real solutions (zero, one, two).</p> <p>19 Identify the graph of quadratic functions.</p> <p>20 Identify graphs of relations involving quadratic inequalities.</p> <p>21 Solve equations involving radicals, limited to square roots.</p> <p>22 Identify the domain and range of specified functions.</p> <p>23 Identify quadratic equations or inequalities for solving real-world problems.</p> <p>24 Identify equations or inequalities that could be used to solve real-world and mathematical problems involving one or two variables.</p> <p>25 Identify properties (e.g., commutative, associative, distributive).</p>	
7 Knowledge of data analysis and probability	10%
<p>1 Compute the mean, median, mode, and range of a set of data.</p> <p>2 Determine whether the mean, median, or mode is the most appropriate measure of central tendency in a given situation.</p> <p>3 Interpret information (e.g., correlation, regression, distributions) from various graphic representations.</p> <p>4 Identify appropriate graphical representations for a given data set.</p> <p>5 Determine probabilities of dependent or independent events.</p> <p>6 Predict odds of a given outcome.</p>	

Competency/Skill		Approx. %
7	Identify an appropriate sample space to determine the probability of a given event.	
8	Make predictions that are based on experimental or theoretical probabilities.	
9	Apply counting principles to solve real-world problems.	
8	Knowledge of geometry and spatial sense	22%
1	Identify angles or pairs of angles as adjacent, complementary, supplementary, vertical, corresponding, alternate interior, alternate exterior, obtuse, acute, or right.	
2	Identify lines and planes as perpendicular, intersecting, skew, or parallel.	
3	Identify triangles using the lengths of their sides or the measures of their angles.	
4	Determine the sum of the measures of the interior angles and the sum of the measures of the exterior angles of convex polygons.	
5	Determine the measures of the specified interior or exterior angles of a triangle or a regular polygon.	
6	Apply the inequality relationships among the angles and sides of a triangle.	
7	Use the SAS, ASA, and SSS postulates to show pairs of triangles congruent, including the case of overlapping triangles.	
8	Solve real-world problems involving similar or congruent figures.	
9	Solve real-world problems applying the Pythagorean theorem and its converse.	
10	Solve real-world problems by applying the 30°-60°-90° or 45°-45°-90° triangle relationships.	
11	Solve right triangle problems by applying tangent, sine, or cosine ratios.	
12	Apply the properties of parallelograms, rectangles, rhombuses, squares, or trapezoids.	
13	Apply the distance formula.	
14	Apply the formula for midpoint.	
15	Identify the coordinates of the vertices of a given polygon when it lies in the coordinate plane.	

Competency/Skill	Approx. %
16 Identify point, line, and plane as undefined terms and symbols for lines, segments, rays, and distances. 17 Identify transformations, dilations, or symmetry of geometric figures. 18 Identify characteristics of three-dimensional figures. 19 Identify the net of a three-dimensional figure. 20 Identify figures that tessellate. 21 Identify the two-dimensional view of a three-dimensional object.	
9 Knowledge of measurement	10%
1 Determine appropriate units and instruments for measuring a given quantity in a real-world context. 2 Estimate measurements, including length, area, volume, weight, time, temperature, and money. 3 Make conversions within the metric or customary systems in a real-world context. 4 Apply the formulas for determining the circumferences and areas of circles in a real-world context. 5 Find the perimeter or area of figures composed of parallelograms, triangles, circles, and trapezoids in a real-world context. 6 Apply the formulas for surface area and volume to right prisms, regular pyramids, right circular cylinders, cones, and spheres in a real-world context. 7 Determine how a change in such dimensions as length, width, height, or radius affects other measurements such as perimeter, area, surface area, and volume. 8 Solve problems involving direct or indirect measurement. 9 Solve real-world problems using money, rates, distance, time, temperature, and angle measures. 10 Interpret scale drawings such as those based on number lines and maps to solve real-world problems.	

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Test Format and Sample Questions

The Middle Grades Mathematics 5–9 subject area test consists of approximately 80 multiple-choice questions. You will have two and one-half hours to complete the test.

Each question will contain four response options, and you will indicate your answer by selecting **A**, **B**, **C**, or **D**.

The table below presents types of questions on the examination and refers you to a sample question of each type.

Type of Question	Sample Question
Word problem Apply mathematical principles to solve a real-world problem and choose the best response option.	Question 2, page 15
Direct question Choose the response option that best answers the question.	Question 4, page 17
Command Select the best response option.	Question 6, page 18
Scenario Examine a situation, problem, or case study. Then answer a question, make a diagnosis, or recommend a course of action by selecting the best response option.	Question 12, page 20
Proofs Select the option that best completes an algebraic or geometric proof.	Question 24, page 24
Graphics Examine a question involving a number line, a geometric figure, graphs of lines or curves, a table, or a chart, and select the best response option.	Question 25, page 25

Sample Questions

The following questions represent both the form and content of questions on the examination. These questions will acquaint you with the general format of the examination; however, these sample questions do not cover all of the competencies and skills that are tested and will only approximate the degree of examination difficulty.

An answer key follows at the end of the sample questions. The answer key includes information regarding the competency to which each question is linked.

DIRECTIONS: Read each question and select the best response.

1. Number Game

Pick a number.

Add 5 to the number.

Next, multiply by 4.

Subtract 12.

Divide by 4.

If x represents the starting number, and y represents the final number, which equation is equivalent to the number game?

A. $y = 2$

B. $y = 2x$

C. $y = x - 2$

D. $y = x + 2$

2. John knows that he can mow a rectangular lawn that measures 20 yards by 40 yards in 2 hours. He estimates that it should take him about 4 hours to mow a rectangular lawn that measures 40 yards by 80 yards. Is John's estimate reasonable?

A. Yes, because doubling the size of the field will double the amount of mowing time.

B. No, because John will be able to mow a longer distance without changing direction, resulting in a shorter mowing time.

C. Yes, because when the perimeter of the field is doubled, the total distance that the mower will need to travel is doubled.

D. No, because doubling the dimensions of the field will increase the area of the field by a factor of 4, resulting in a mowing time of about 8 hours.

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3. A family puts \$1000 into an account that pays an annual interest rate of 10%, compounded annually. No money is added or withdrawn from the account. Which of the following tables shows the amount in the account at the end of each of the first 3 years?

A.

Year	Account balance
End of Year 1	\$1100
End of Year 2	1200
End of Year 3	1300

B.

Year	Account balance
End of Year 1	\$1100
End of Year 2	1210
End of Year 3	1331

C.

Year	Account balance
End of Year 1	\$1111
End of Year 2	1222
End of Year 3	1333

D.

Year	Account balance
End of Year 1	\$1100
End of Year 2	1200
End of Year 3	1400

-
-
4. Which of the following is an appropriate translation for "four more than twice the sum of a number and two is at most ten"?
- A. $4 + 2n + 2 \geq 10$
 - B. $4 + 2n + 2 \leq 10$
 - C. $4 + 2(n + 2) \geq 10$
 - D. $4 + 2(n + 2) \leq 10$
5. A die is rolled 50 times with the results shown in the table. What is the experimental probability of rolling a 4?

Results of Die-Rolling Experiment

Outcome	1	2	3	4	5	6
Frequency	10	9	11	12	8	0

- A. $\frac{4}{12}$
- B. $\frac{4}{5}$
- C. $\frac{12}{50}$
- D. $\frac{10}{50}$

6. A teacher is going to develop the concept of squaring a binomial expression. Identify the most appropriate model to use.

A.
$$\begin{array}{c} b \\ \hline a \square \end{array} + \begin{array}{c} b \\ \hline a \square \end{array}$$

B.
$$\begin{array}{c} b \\ \hline a \square \end{array} \times \begin{array}{c} b \\ \hline a \square \end{array}$$

C.
$$\begin{array}{c} a+b \\ \hline \begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} \\ \hline \begin{array}{c} a \\ + \\ b \end{array} \end{array}$$

D.
$$\begin{array}{c} b \\ \hline a \square \end{array} \times \begin{array}{c} b \\ \hline a \square \end{array} + \begin{array}{c} b \\ \hline \square \end{array}$$

7. In general, division can be defined by which equation, assuming $b \neq 0$?

- A. $a \div b = c$ if and only if $c \cdot b = a$
- B. $a \div b = c$ if and only if $c \cdot a = b$
- C. $a \div b = c$ if and only if $c = a - b$
- D. $a \div b = c$ if and only if $b = c \div a$

-
-
8. Consider the following conjecture: *The sum of an even number and an odd number is an odd number.*

Which of the following pairs of values would be used in trying to determine the reasonableness of this conjecture?

- A. -18 and 21
 - B. 13 and 19
 - C. 4 and -6
 - D. 0 and 12
9. Which conclusion can be drawn from the following premises alone?
- If line a is parallel to line b, then line b is parallel to line c. If line b is parallel to line c, then line a is perpendicular to line d.
- A. Line a is parallel to line b.
 - B. Line a is perpendicular to line d.
 - C. If line a is perpendicular to line d, then line a is parallel to line b.
 - D. If line a is parallel to line b, then line a is perpendicular to line d.
10. Which concept would students need to understand before starting a lesson on simplifying fractions?
- A. least common multiple
 - B. order of operations
 - C. greatest common factor
 - D. solving proportions

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11. In solving the linear equation $5x - 9 = 3x + 3$, Francisco wrote $5x + 3x - 9 = 3x - 3x + 3$ as the next step. Identify the error Francisco made.
- A. Francisco added and subtracted the same amount on opposite sides of the equation.
 - B. Francisco multiplied and divided the same amount on both sides of the equation.
 - C. Francisco subtracted the same amount on both sides of the equation.
 - D. Francisco added the same amount on both sides of the equation.
12. A student wants to purchase a wallpaper border for her bedroom. The border is sold in rolls 8 yards long and 10 inches wide. The room measures 12 feet by 13 feet. By performing the following operations, she determines that she needs 6 rolls of border.

$$\frac{2(13+12)}{8} = 6.25$$

Which statement best explains the student's mathematical error?

- A. She rounded incorrectly and thought she needed only 6 rolls.
 - B. She found the perimeter instead of the area of the room.
 - C. She did not change all of the dimensions to the same units.
 - D. She used an incorrect formula for perimeter.
13. Identify the proportion that would correctly solve the following problem.

Chris and Kelly will divide a profit of \$400 in the ratio 5:3. If Chris receives the smaller amount, how much will Chris receive?

- A. $\frac{5}{8} = \frac{400}{x}$
- B. $\frac{3}{8} = \frac{x}{400}$
- C. $\frac{3}{5} = \frac{x}{400}$
- D. $\frac{3}{5} = \frac{400}{x}$

14. What is the expression $2^{-3} \times 2^2$ equivalent to?

- A. 4
- B. 2
- C. $\frac{1}{2}$
- D. $\frac{1}{4}$

15. Simplify.

$$2\sqrt{12} + \sqrt{27}$$

- A. $7\sqrt{3}$
- B. $2\sqrt{39}$
- C. $3\sqrt{39}$
- D. $11\sqrt{3}$

16. A school has a total enrollment of 1720 students. One day 129 students were absent. What percent were absent?

- A. 0.075%
- B. 7.5%
- C. 12.9%
- D. 13.3%

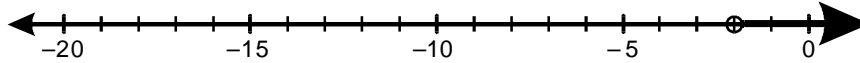
17. Which of the following rules represents a function?

- A. $\{(x, y): y^2 = x^2\}$
- B. $\{(x, y): y = x^2\}$
- C. $\{(x, y): |y| = x^2\}$
- D. $\{(x, y): y^2 = x\}$

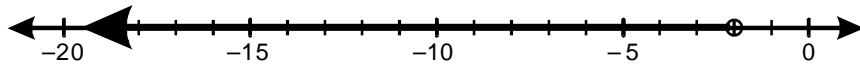
18. Which graph represents the following inequality?

$$5z + 10 > 0$$

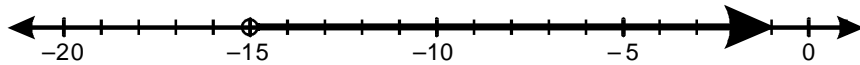
A.



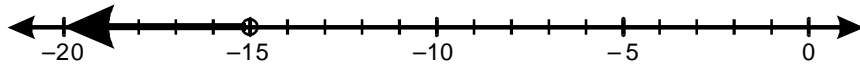
B.



C.



D.



19. Solve.

$$9 = \sqrt{y - 4} + 7$$

- A. -8
- B. 0
- C. 4
- D. 8

20. At a bake sale, cookies were sold for \$0.50 each and muffins were sold for \$0.75 each. If a total of 41 items were sold, and the total amount of money received was \$25.00, how many of each type of baked good were sold?

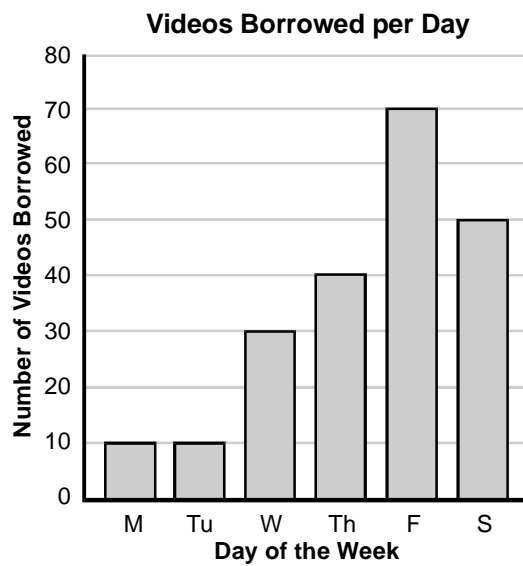
If c equals the number of cookies sold and m equals the number of muffins sold, which of the following pairs of equations could be used to solve the problem above?

- A. $0.5c + 0.75m = 25$, $c + m = 41$
- B. $0.5c + 0.75m = 41$, $c + m = 25$
- C. $0.5m + 0.75c = 25$, $c + m = 41$
- D. $0.5m + 0.75c = 41$, $c + m = 25$

21. To the nearest tenth, find the mean weight of a group of pears with individual weights of 4.7, 4.0, 6.2, 6.5, 6.1, 6.5, 4.7, and 6.0 oz.

- A. 4.7 oz
- B. 5.6 oz
- C. 6.1 oz
- D. 6.2 oz

22. The graph shows the number of videos borrowed from a library over a 6-day period. What is the average number of videos borrowed per day?

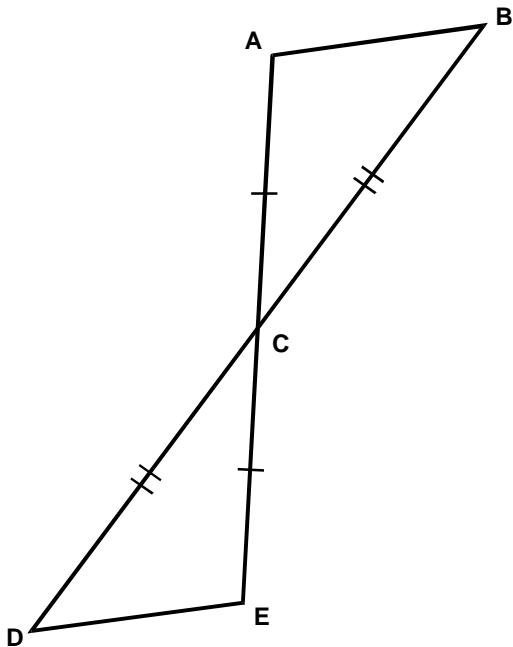


- A. 30
- B. 35
- C. 40
- D. 70

23. In a random poll of shoppers at a mall, 32 out of 40 shoppers surveyed live in the same town where the mall is located. On average, 3250 shoppers visit the mall each day. Estimate the number of out-of-town shoppers that visit the mall each day.

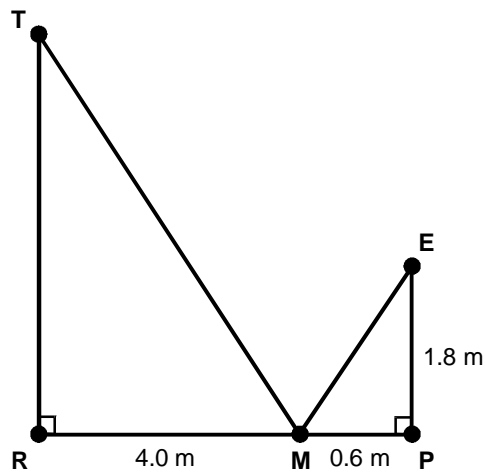
- A. 100
- B. 256
- C. 320
- D. 650

24. What method would be used to prove $\triangle ABC \cong \triangle EDC$?



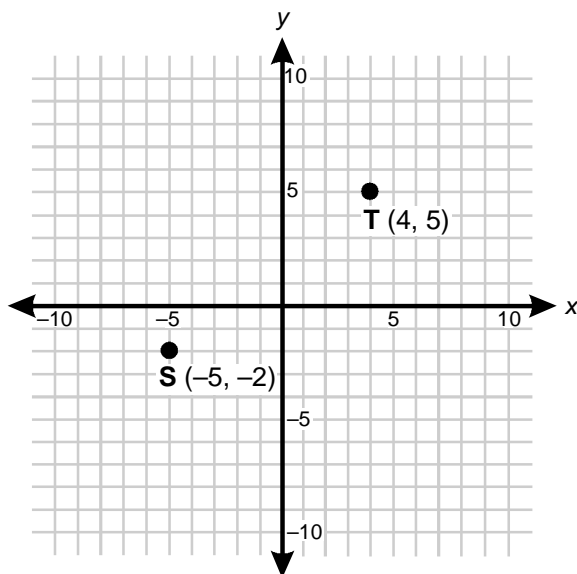
- A. SAS
- B. SSS
- C. ASA
- D. AAS

-
-
25. The height TR of a tree may be measured by using similar triangles. A mirror is placed at point M so that the top of the tree is sighted in the mirror by a person standing at point P . The person's eye is at point E . Given the measurements shown in the diagram, what is the length of \overline{TR} ?



- A. $.2\text{ m}$
B. 7.2 m
C. 9.0 m
D. 12.0 m

26. What is the distance from point S to point T?



- A. 4
B. 10
C. $\sqrt{130}$
D. $\sqrt{136}$
27. The transformation $T(x, y) = (2x, 2y)$ is applied to $\triangle ABC$. Which of the following describes its image, $\triangle PQR$?
- A. $\triangle PQR$ is congruent to $\triangle ABC$ and moved two spaces to the right.
B. $\triangle PQR$ is congruent to $\triangle ABC$ and moved two spaces to the left.
C. $\triangle PQR$ is similar to $\triangle ABC$ with a scale factor of 2:1.
D. $\triangle PQR$ is similar to $\triangle ABC$ with a scale factor of 1:4.

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28. The volume of juice squeezed from an orange should be expressed in which unit?
- A. milliliter
 - B. milligram
 - C. kiloliter
 - D. kilogram
29. A gardener uses a piece of wire fencing 6 meters long to enclose a circular region for a garden. What is the radius of the garden?
- A. $\frac{3}{\pi}$ m
 - B. $\frac{6}{\pi}$ m
 - C. 9π m
 - D. 36π m
30. The scale on a blueprint drawing is $\frac{1}{4}$ in = 1 ft. If on the blueprint a living room is $3\frac{3}{4}$ inches wide, what is the actual width of the room?
- A. $3\frac{3}{4}$ ft
 - B. 4 ft
 - C. $12\frac{3}{4}$ ft
 - D. 15 ft

Answer Key

Question Number	Correct Response	Competency
1.	D	1
2.	D	1
3.	B	1
4.	D	2
5.	C	2
6.	C	2
7.	A	3
8.	A	3
9.	D	3
10.	C	4
11.	A	4
12.	C	4
13.	B	5
14.	C	5
15.	A	5
16.	B	5
17.	B	6
18.	A	6
19.	D	6
20.	A	6
21.	B	7
22.	B	7
23.	D	7
24.	A	8
25.	D	8
26.	C	8
27.	C	8
28.	A	9
29.	A	9
30.	D	9



Annotated Bibliography

The annotated bibliography that follows includes basic references that you may find useful in preparing for the exam. Each resource is linked to the competencies and skills found in Section 4 of this guide.

This bibliography is representative of the most important and most comprehensive texts pertaining to the competencies and skills. The Florida Department of Education does not endorse these references as the only appropriate sources for review; many comparable texts currently used in teacher preparation programs also cover the competencies and skills that are tested on the exam.

1. Ballman, A.E., Bragg, S.C., Charles, R.I., Handlin, W.G., & Kennedy, D. (2007). *Algebra II*. Upper Saddle River, NJ: Pearson Prentice Hall.

Develops readiness for trigonometry, statistics, and precalculus. Reviews and reinforces key skills throughout the text. Useful for review of competencies 1, 3, 5, 6, 7, 8, and 9.

2. Bennett, J. (2004). *Holt middle school math, course 3*. Austin, TX: Holt, Rinehart and Winston.

The final component in a program to ease the transition from arithmetic into algebra. Contains materials to help teachers plan and pace lessons. Useful for review of competencies 1, 2, 3, 4, 5, and 9.

3. Billstein, R., Shlomo, L., & Lott, J. (2007). *A problem solving approach to mathematics for elementary school teachers* (9th ed.). Boston: Pearson Addison-Wesley.

A comprehensive, skills-based resource emphasizing active and collaborative learning. Useful for review of competencies 1, 2, 3, 4, and 5.

4. Boyd, C.J. (2004). *Glencoe mathematics: Geometry*. New York: Glencoe/McGraw-Hill.

Familiarizes students with the types of questions and formats they will face on local, state, and national tests. Useful for review of competencies 1, 2, 3, 4, 5, and 6.

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5. Burgis, K., & Morford, J. (2006). *Investigating college algebra and trigonometry with technology*. Emeryville, CA: Key College Publishing.
Guides students in using graphing calculators and other technologies to explore patterns and to make, test, and generalize conjectures through investigative, collaborative learning. Useful for review of competencies 2, 6, and 8.

 6. Collins, W., Cuevas, G., Foster, A.G., Gordon, B., Moore-Harris, B., Rath, J., et al. (2001). *Algebra 2: Integration, applications, connections*. New York: Glencoe/McGraw-Hill.
Balances sound skill and concept development with applications, connections, problem solving, critical thinking, and technology. Useful for review of competencies 1, 3, 5, 6, 7, 8, and 9.

 7. Larson, R., Boswell, L., Kanold, T., & Stiff, L. (2004). *Algebra I: Applications, equations, graphs*. Evanston, IL: McDougal Littell.
Helps Algebra I students connect to essential mathematics concepts with integrated print and technology support. Useful for review of competencies 1, 3, 5, 6, 7, 8, and 9.

 8. Larson, R., Boswell, L., Kanold, T.D., & Stiff, L. (2007). *Middle school math course 3*. Evanston, IL: McDougal Littell.
A platform for active learning, flexible lesson planning, and effective assessment. Useful for review of competencies 1, 3, 5, 6, 7, 8, and 9.

 9. Long, C.T., & DeTemple, D. (2005). *Mathematical reasoning for elementary teachers* (4th ed.). Boston: Pearson Addison-Wesley.
Meaningful content and pedagogy to arm education students with the tools they will need to become excellent elementary or middle school teachers. Focuses on professional development and connecting the material to the classroom. Useful for review of competencies 1, 2, 3, 4, and 5.

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- 10.** Mandery, M., & Schneider, M. (2000). *Achieving proficiency in mathematics*. New York: AMSCO School Publications.

Promotes mathematical mastery through critical thinking and applied strategies, including use of the calculator as a tool for exploration and implementation. Emphasizes data reading and interpreting statistical information summarized in tables, bar graphs, and line graphs. Useful for review of competencies 1, 2, 3, 4, and 5.
 - 11.** Moore, D. (2007). *The basic practice of statistics*. (4th ed.). New York: W.H. Freeman.

Introduces students with limited mathematical backgrounds to the same tools, techniques, and interpretive skills that working statisticians rely on. Useful for review of competencies 1, 2, and 7.
 - 12.** Musser, G.L., Burger, W.F., & Peterson, B.E. (2004). *Essentials of mathematics for elementary teachers* (6th ed.). Hoboken, NJ: Wiley.

Incorporates the many facets of elementary and middle school mathematics in one concise volume. Provides an understanding of mathematics that translates immediately into the classroom. Useful for review of competencies 1, 2, 3, 4, and 5.
 - 13.** Perkowski, D., & Perkowski, M. (2007). *Data analysis and probability connections: Mathematics for middle school teachers*. Upper Saddle River, NJ: Pearson Prentice Hall.

Uses illustrations to assist in making explicit connections between a typical college elementary statistics course and the statistical concepts taught by middle school teachers. Useful for review of competencies 1, 2, 3, 4, 5, 7, and 8.
 - 14.** Posamentier, A.S., Smith, B.S., & Stepelman, J. (2006). *Teaching secondary mathematics: Techniques and enrichment units* (7th ed.). Upper Saddle River, NJ: Pearson Merrill Prentice Hall.

Discusses current methods of teaching mathematics, beginning with a brief overview of the history of mathematics education. Includes standards for teaching and assessment. Useful for review of competencies 1, 3, 5, 6, 7, 8, and 9.

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15. Serra, M. (2008). *Discovering geometry: An investigative approach* (4th ed.). Berkeley, CA: Key Curriculum Press.
Enables students to learn theorems and definitions by performing constructions, measuring figures, relating patterns and properties, and discussing findings. Uses real-world applications, puzzles, and extensions to keep students involved and thinking. Useful for review of competencies 1, 3, 5, 6, 7, 8, and 9.
16. Smith, K.J. (1991). *Problem solving (Brooks/Cole one-unit series in precalculus mathematics)*. Belmont, CA: Brooks/Cole.
Covers many areas under algebra, trigonometry, some calculus, statistics, and probability. Useful for review of competencies 1, 3, 5, 6, 7, 8, and 9.
17. Van de Walle, J. (2006). *Elementary and middle school mathematics: Teaching developmentally* (6th ed.). Boston: Pearson Allyn & Bacon.
Presents four key aspects of teaching mathematics: the nature of mathematics as a science of pattern and order, an understanding of how children learn mathematics, a problem-solving view of teaching mathematics, and specific methods for integrating assessment with instruction. Useful for review of competencies 1, 2, 3, 4, 5, and 7.
18. Wheeler, R., & Wheeler, E. (2005). *Modern mathematics: Fundamentals and concepts* (12th ed.). Dubuque, IA: Kendall/Hunt Publishing Co.
Addresses selected topics without compromising coverage of critical prerequisites. Useful for review of competencies 1, 2, 3, 4, 5, and 7.



Additional Information

Please visit the following Web site to review FTCE registration details and to find additional FTCE information, including test locations and passing scores.

<http://www.fldoe.org/asp/ftce>

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