

2006

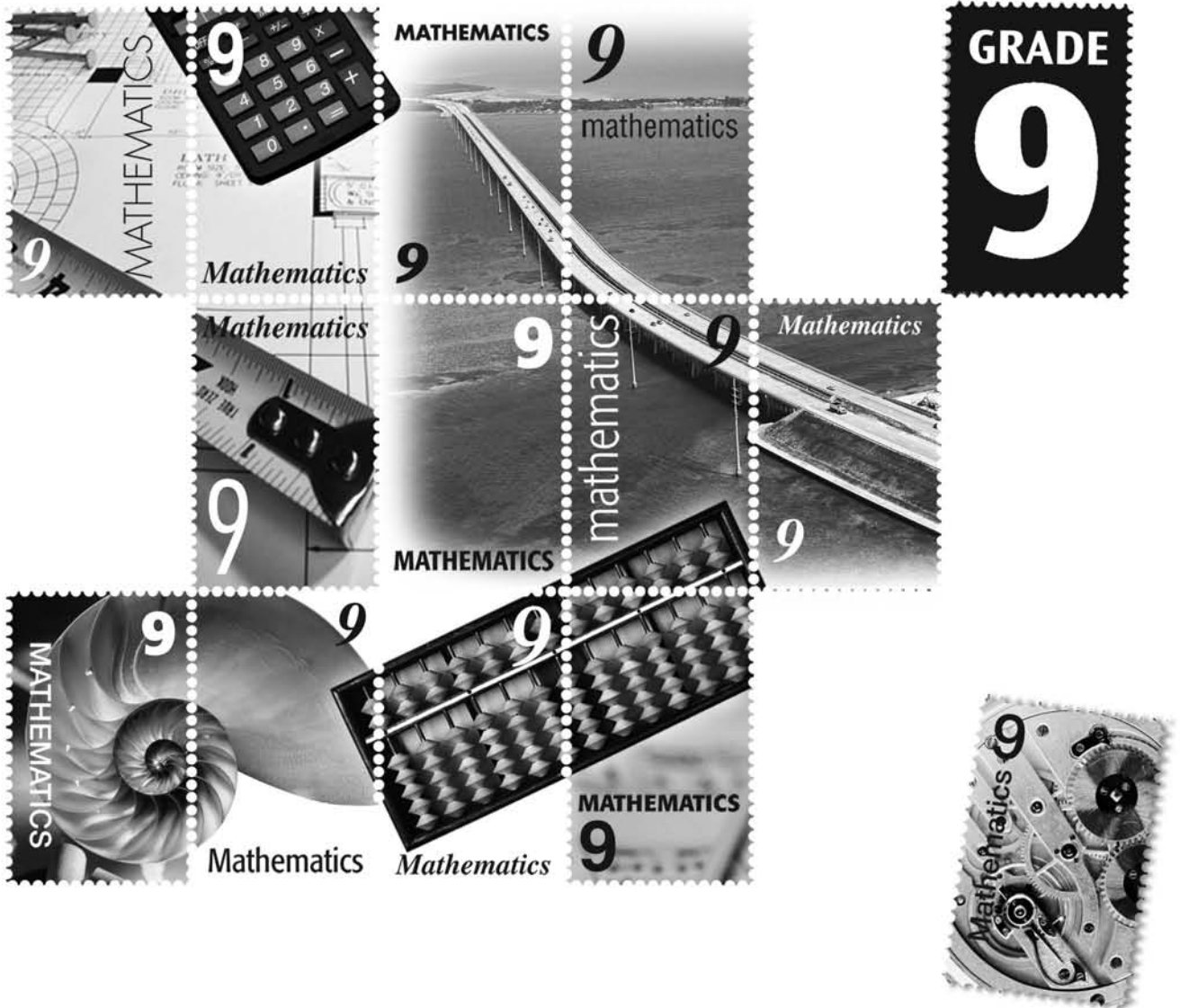
FCAT

Florida Comprehensive Assessment Test

Student Name _____

MATHEMATICS

SAMPLE TEST BOOK



FCAT Sample Test Materials

These sample test materials are designed to help you prepare to answer FCAT questions. These materials introduce you to the kinds of questions you will answer when you take FCAT and include hints for responding to the different kinds of FCAT questions. The FCAT Mathematics sample test materials for Grade 9 are composed of the books described below:

- ☒ **Sample Test and Answer Book**
Includes a mathematics sample test, a sample answer sheet, and instructions for completing the sample test. (Copies are available for all students in the tested grade.)
 - ☐ **Sample Answer Key**
Includes answers and explanations for the questions in the sample test. (Copies are available for classroom teachers only.)
- ☒ = This book

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FCAT Mathematics Sample Test Book



Calculator Instructions Page 3

A calculator is provided for you to use during the test. This section provides helpful hints for using a calculator on the test.

Gridded-Response Instructions Page 4

Some FCAT Mathematics questions require you to provide your answers by filling in numeric grids. This section shows different ways of completing the response grids correctly.

Taking the FCAT Mathematics Sample Test Page 8

This section introduces the FCAT Mathematics Sample Test. It includes hints for answering FCAT Mathematics questions, and an estimate of the time required to complete the sample test.

FCAT Mathematics Sample Test Page 9

The Mathematics Sample Test consists of 15 practice questions that are similar to questions on the FCAT. It includes a perforated (tear-out) Mathematics Reference Sheet found on page 11.

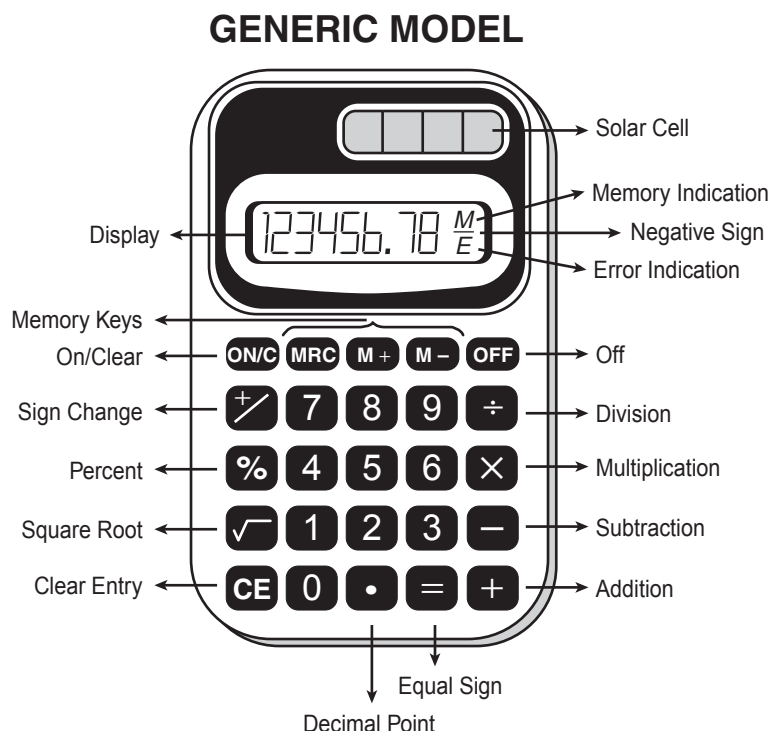
FCAT Mathematics Sample Answer Sheet Page 27

Your answers to the sample test questions should be placed on the Sample Answer Sheet. The answer sheet is perforated and may be removed before you start the sample test.

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Calculator Instructions

This is a picture of a generic calculator and its parts.



HELPFUL HINTS FOR TAKING THE FCAT MATHEMATICS TEST

1. ☐ Read the problem very carefully. Then decide whether or not you need the calculator to help you solve the problem.
2. ☐ When starting a new problem, always clear your calculator by pressing the clear key.
3. ☐ If you see an **E** in the display, clear the error before you begin.
4. ☐ If you see an **M** in the display, clear the memory and the calculator before you begin.
5. ☐ If the number in the display is not one of the answer choices, check your work. Remember that when computing with certain types of fractions, you may have to round the number in the display.
6. ☐ Remember, your calculator will NOT automatically perform the algebraic order of operations.
7. ☐ Calculators might display an incorrect answer if you press the keys too quickly. When working with calculators, use careful and deliberate keystrokes, and always remember to check your answer to make sure that it is reasonable.
8. ☐ The negative sign may appear either to the left or to the right of the number.
9. Always check your answer to make sure that you have completed all of the necessary steps.

How to Complete the Response Grids

Mathematics test questions with this symbol  require that you fill in a grid on your answer sheet. There may be more than one correct way to fill in a response grid. This section shows you different ways the response grid may be completed.

Parts of a Response Grid

For Grade 9, response grids have the following parts:

	/	/	/		
.	.	.	.	.	.
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

} answer boxes
fraction bar
decimal point
number bubbles

Directions

1. Work the problem and find an answer.
2. Write your answer in the answer boxes at the top of the grid.
 - Print your answer with the first digit in the left answer box, OR with the last digit in the right answer box.
 - Print only one digit or symbol in each answer box. Do NOT leave a blank answer box in the middle of an answer.
 - Be sure to write a decimal point or fraction bar in the answer box if it is a part of the answer.

3. Fill in a bubble under each box in which you wrote your answer.

- Fill in one and ONLY one bubble for each answer box. Do NOT fill in a bubble under an unused answer box.
- Fill in each bubble by making a solid black mark that completely fills the circle.
- You MUST fill in the bubbles accurately to receive credit for your answer.

Examples

Whole Number

$$60 + 10 =$$

7	0							7	0
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
☒	☐	☐	☐	☐	☐	☐	☐	☐	☒
0	1	2	3	4	0	1	2	3	4
5	6	7	8	9	5	6	7	8	9

OR

7	0							7	0
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
0	1	2	3	4	0	1	2	3	4
5	6	7	8	9	5	6	7	8	9

Decimal

Show the decimal equivalent of $5\frac{6}{100}$.

5	.	0	6		5	.	0	6	
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
0	1	2	3	4	0	1	2	3	4
5	6	7	8	9	5	6	7	8	9

OR

5	.	0	6		5	.	0	6	
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
0	1	2	3	4	0	1	2	3	4
5	6	7	8	9	5	6	7	8	9

NOTE: You may NOT write a mixed number such as $13\frac{1}{4}$ in the answer grid. If your answer is a mixed number, you must convert the answer to an improper fraction, such as $\frac{53}{4}$, or to a decimal number, such as 13.25. If you tried to fill in $13\frac{1}{4}$, it would be read as $\frac{131}{4}$ and would be counted wrong.

$$12\frac{3}{4} + \frac{1}{2} =$$

When a percent is required to answer a question, do NOT convert the percent to its decimal or fractional equivalent. Grid in the percent value without the % symbol.

30%

Decimal or Fraction

Many answers may be shown as either a decimal or a fraction.

.	6	2	5	
	/	/	/	
•	•	•	•	•
0	0	0	0	0
1	1	1	1	1
2	2	•	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	•	5
6	•	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

OR

	.	6	2	5
	/	/	/	
•	•	•	•	•
0	0	0	0	0
1	1	1	1	1
2	2	2	•	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	•
6	6	•	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

OR

5	5	/	8	8
	/	•	/	
•	•	•	•	•
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	•	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	•	•
9	9	9	9	9

OR

		5	/	8
	/	/	•	
•	•	•	•	•
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	•	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	•
9	9	9	9	9

Ranges

A correct answer within a range of values may be represented in various ways. For example, for the inequality

$$18.8 < n < 19.2$$

values of n could be written as shown below.

1	8	.	9	
	/	/	/	
•	•	•	•	•
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	•	8	8	8
9	9	9	•	9

OR

1	9			
	/	/	/	
•	•	•	•	•
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	•	9	9	9

OR

			1	9
	/	/	/	
•	•	•	•	•
0	0	0	0	0
1	1	1	•	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	•

OR

	1	9	.	1
	/	/	/	
•	•	•	•	•
0	0	0	0	0
1	•	1	1	•
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	•	9	9

There are also other correct answers.

Taking the FCAT Mathematics Sample Test

Hints for Taking the FCAT Mathematics Test

Here are some hints to help you do your best when you take the FCAT Mathematics test. Keep these hints in mind when you answer the sample questions.

- ✓ **Read each question carefully and think about ways to solve the problem before you try to answer the question.**
- ✓ **Answer the questions you are sure about first. If a question seems too difficult, skip it and go back to it later.**
- ✓ **Be sure to fill in the answer bubbles correctly. Do not make any stray marks around answer spaces.**
- ✓ **Think positively. Some problems may seem hard to you, but you may be able to figure out what to do if you read each question carefully.**
- ✓ **When you have finished each problem, reread it to make sure your answer is reasonable.**
- ✓ **Relax. Some people get nervous about tests. It's natural. Just do your best.**

Directions for Taking the Mathematics Sample Test

This Sample Test contains the Reference Sheet and 15 questions. It should take about 20 to 25 minutes to answer all the questions. You will mark your answers on the Sample Answer Sheet on page 27 of this book. If you don't know how to work a problem, just ask your teacher to explain it to you. Your teacher has the answers to the sample questions.

You may need formulas and conversions to help you solve some of the problems. You may refer to the Reference Sheet on page 11 as often as you like.

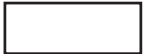
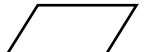
Use the space in your Sample Mathematics Test Book to do your work, but be sure to mark your answers on the Sample Answer Sheet.

FCAT *Mathematics* *Sample* Test



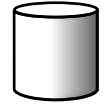
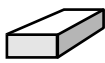
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Grades 9–10 FCAT Mathematics Reference Sheet

Area		
	Triangle	$A = \frac{1}{2}bh$
	Rectangle	$A = lw$
	Trapezoid	$A = \frac{1}{2}h(b_1 + b_2)$
	Parallelogram	$A = bh$
	Circle	$A = \pi r^2$

KEY	
b = base	d = diameter
h = height	r = radius
l = length	A = area
w = width	C = circumference
ℓ = slant height	V = volume
$S.A.$ = surface area	
Use 3.14 or $\frac{22}{7}$ for π .	

Circumference
 $C = \pi d$ or $C = 2\pi r$

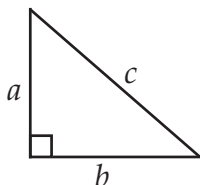
Volume/Capacity		Total Surface Area	
	Right Circular Cone	$V = \frac{1}{3}\pi r^2 h$	$S.A. = \frac{1}{2}(2\pi r)\ell + \pi r^2$ or $S.A. = \pi r\ell + \pi r^2$
	Right Square Pyramid	$V = \frac{1}{3}lwh$	$S.A. = 4(\frac{1}{2}l\ell) + l^2$ or $S.A. = 2l\ell + l^2$
	Sphere	$V = \frac{4}{3}\pi r^3$	$S.A. = 4\pi r^2$
	Right Circular Cylinder	$V = \pi r^2 h$	$S.A. = 2\pi rh + 2\pi r^2$
	Rectangular Prism	$V = lwh$	$S.A. = 2(lw) + 2(hw) + 2(lh)$

In the following formulas, n represents the number of sides.

- In a polygon, the sum of the measures of the interior angles is equal to $180(n - 2)$.
- In a regular polygon, the measure of an interior angle is equal to $\frac{180(n - 2)}{n}$.

Grades 9–10 FCAT Mathematics Reference Sheet

Pythagorean theorem:



$$a^2 + b^2 = c^2$$

Distance between two points

$P_1(x_1, y_1)$ and $P_2(x_2, y_2)$:

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Midpoint between two points

$P_1(x_1, y_1)$ and $P_2(x_2, y_2)$:

$$\left(\frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2} \right)$$

Slope-intercept form of an equation of a line:

$$y = mx + b$$

where m = slope and b = the y -intercept.

Distance, rate, time formula:

$$d = rt$$

where d = distance, r = rate, t = time.

Simple interest formula:

$$I = prt$$

where p = principal, r = rate, t = time.

Conversions

1 yard = 3 feet = 36 inches

1 mile = 1760 yards = 5280 feet

1 acre = 43,560 square feet

1 hour = 60 minutes

1 minute = 60 seconds

1 liter = 1000 milliliters = 1000 cubic centimeters

1 meter = 100 centimeters = 1000 millimeters

1 kilometer = 1000 meters

1 gram = 1000 milligrams

1 kilogram = 1000 grams

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 pound = 16 ounces

1 ton = 2000 pounds

Metric numbers with four digits are presented without a comma (e.g., 9960 kilometers). For metric numbers greater than four digits, a space is used instead of a comma (e.g., 12 500 liters).

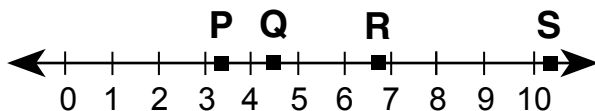
- 1 In 1997, the population of the United States was expected to increase by approximately 10.4 million people by the year 2002.

What is 10.4 million expressed in scientific notation?

- A. 1.04×10^6
- B. 1.04×10^{-6}
- C. 1.04×10^7
- D. 1.04×10^{-7}

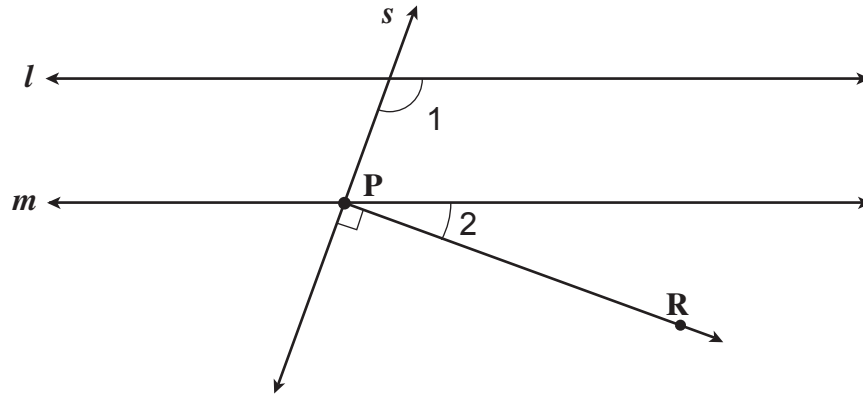
- 2 An architect found a side of a right triangle on a blueprint to be $\sqrt{21}$ centimeters.

Which point is closest to $\sqrt{21}$ on the number line?



- F. P
- G. Q
- H. R
- I. S

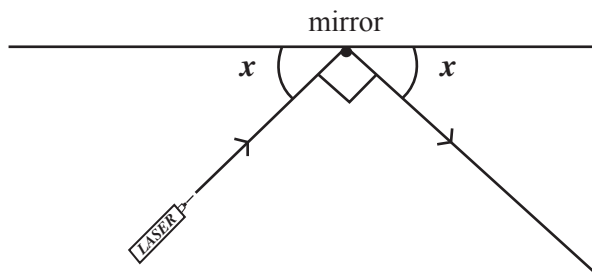
- 3 In this drawing, line l is parallel to line m and line s is perpendicular to $\overrightarrow{PR}$. The measure of $\angle 1$ is 110 degrees.



What is the measure of $\angle 2$?

- A. 110°
- B. 70°
- C. 40°
- D. 20°

- 4 A laser beam in a science lab is aimed at a mirror.



The angle at which the incoming beam hits the mirror is equal to the angle at which the beam is reflected from the mirror. What is the measure of the angle at which the beam is reflected from the mirror?

- F. 30°
- G. 45°
- H. 60°
- I. 90°

- 5 Look at the function table below.



x	y
0	1
1	2
2	5
3	10
4	17
5	?
6	37

If the pattern continues, what is the value of y when $x = 5$?

6

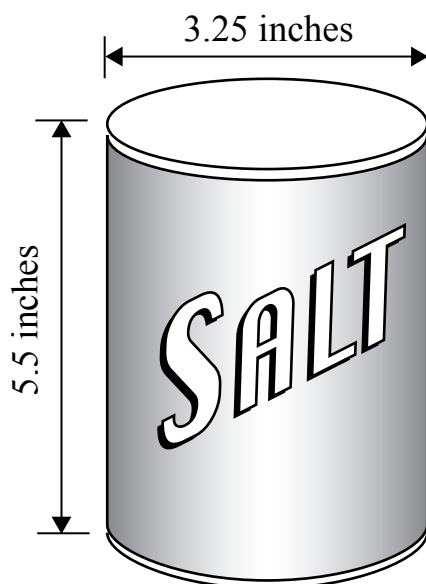
The height, H , in centimeters, of a woman whose humerus bone is x centimeters long can be represented by the formula below.

$$H = 2.75x + 71.48$$

Based on the formula, what is the height, to the nearer centimeter, of a woman whose humerus bone is 33 centimeters long?

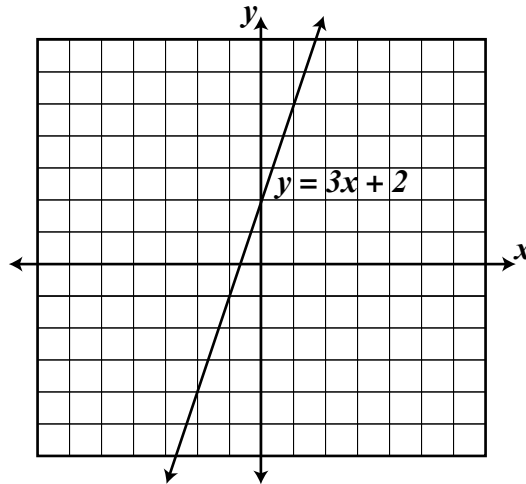
7

A restaurant owns salt shakers with a volume of 0.687 cubic inches each. The restaurant purchases salt in a right-cylindrical container with the dimensions shown.



Assuming the above container is full, what is the maximum number of salt shakers that could be completely filled from 1 container of salt?

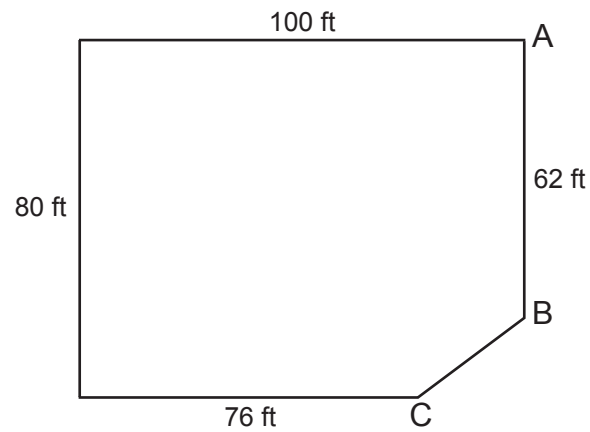
- 8 The graph of $y = 3x + 2$ is shown.



How would the graph change if the 2 in the equation was replaced with a 5?

- A. The line would remain parallel with a shift down of 3 units.
- B. The line would remain parallel with a shift down of 2 units.
- C. The line would remain parallel with a shift up of 3 units.
- D. The line would remain parallel with a shift up of 2 units.

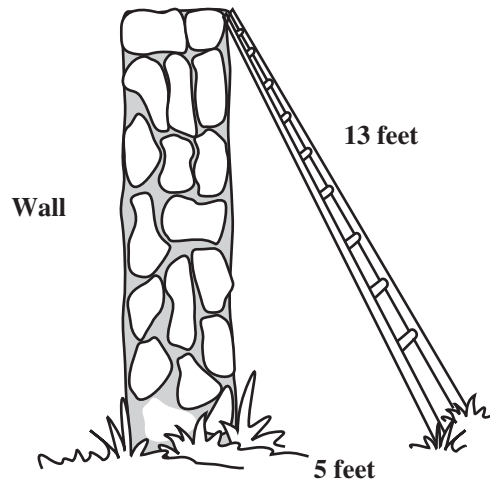
- 9 The drawing shows the floor plan for an office space. Three of the corners of the floor plan are right angles.



An electrician plans to run wiring along the perimeter of the space from point *A* to point *C*, passing through point *B*. What is the minimum number of feet of wire that the electrician will need?

- F. 80 ft
- G. 86 ft
- H. 92 ft
- I. 104 ft

- 10 The bottom of a 13-foot-long ladder is placed 5 feet away from a wall so that the ladder rests against the top as shown.



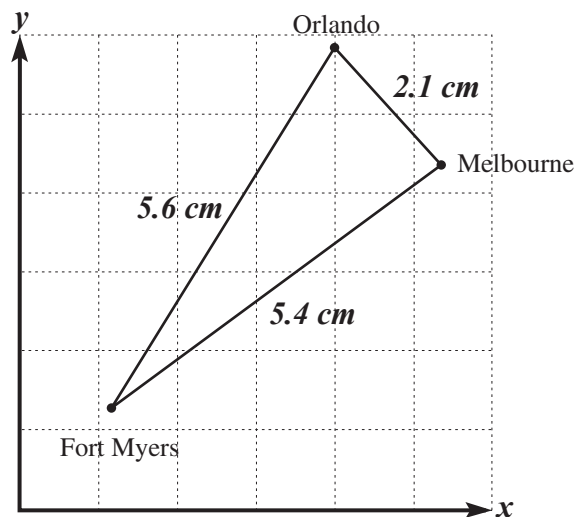
Assuming the wall is perpendicular to the ground, what is the height of the wall?

- A. 8 feet
- B. 12 feet
- C. 14 feet
- D. 18 feet

11

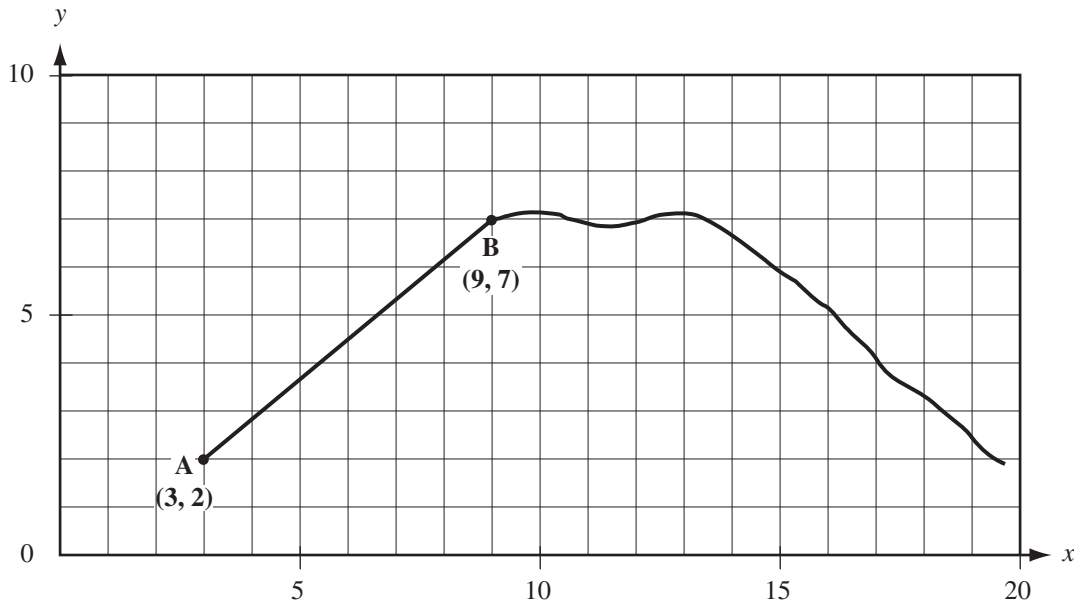


A triangle can be formed by drawing lines on a map that connect the cities of Orlando, Melbourne, and Fort Myers. On the map, the distance between Orlando and Melbourne is 2.1 cm, the distance between Orlando and Fort Myers is 5.6 cm, and the distance between Melbourne and Fort Myers is 5.4 cm.



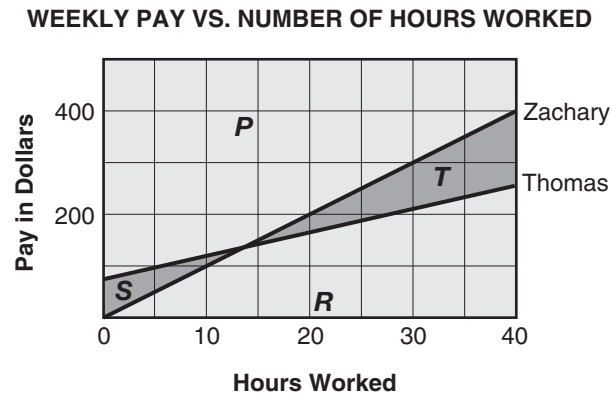
If the distance between Orlando and Fort Myers is 140 miles, what is the distance, in miles, between Orlando and Melbourne?

- 12 Lana is drawing a shield volcano on the grid below.



What is the slope of the side of the volcano between points A and B ?

- 13 Fred, Thomas, and Zachary worked at the ice cream store in the mall. Last week, Fred earned more money than Thomas, but less than Zachary. The graph shows the money earned by Zachary and Thomas.

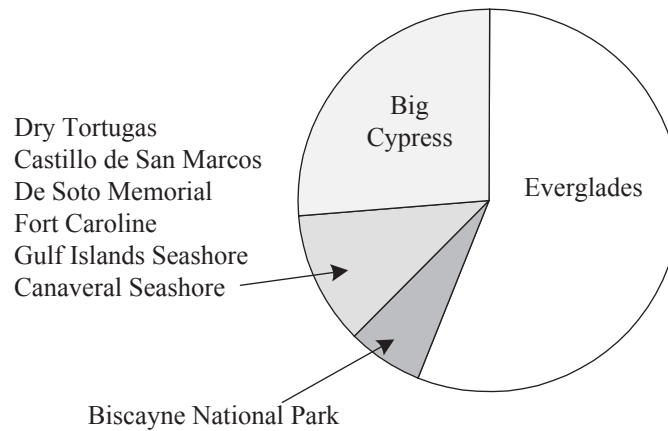


Which area of the graph represents Fred's possible weekly pay?

- F. P
- G. R
- H. S
- I. T

- 14 The circle graph below represents the areas of nine national parks located in Florida in 2001.

**AREAS OF NINE
NATIONAL PARKS IN FLORIDA**



The largest of these, the Everglades, contained about 1.5 million acres in 2001. Which of these is closest to the number of acres that was contained in the other eight designated parks in 2001?

- A. 300,000 acres
- B. 700,000 acres
- C. 1,200,000 acres
- D. 2,700,000 acres

- 15 The menu at a restaurant offers the following choices.

MENU		
Sandwiches	Cheese	Salads
Tuna	American	Potato
Roast beef	Cheddar	Fruit
Egg salad	Jack	Pasta
Chicken salad	Swiss	
Turkey		
Vegetable		

How many different combinations are possible when selecting 1 sandwich, 1 cheese, and 1 salad?

- F. 13
- G. 26
- H. 72
- I. 112



This is the end of the Mathematics Sample Test.
Until time is called, go back and check your work or answer questions you did not complete. When you have finished, close your Sample Test Book.

Name _____

Answer all the questions that appear in the Mathematics Sample Test Book on this Sample Answer Sheet.

1

(A) (B) (C) (D)

2

(F) (G) (H) (I)

3

(A) (B) (C) (D)

4

(F) (G) (H) (I)

5

	/	/	/	
•	•	•	•	•
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

6

	/	/	/	
•	•	•	•	•
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

7

	/	/	/	
•	•	•	•	•
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

8

(A) (B) (C) (D)

9

(F) (G) (H) (I)

Fold and Tear Carefully Along Dotted Line.

10 (A) (B) (C) (D)

11

	7	7	7	
•	•	•	•	•
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

12

	7	7	7	
•	•	•	•	•
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

13 (F) (G) (H) (I)

14 (A) (B) (C) (D)

15 (F) (G) (H) (I)

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