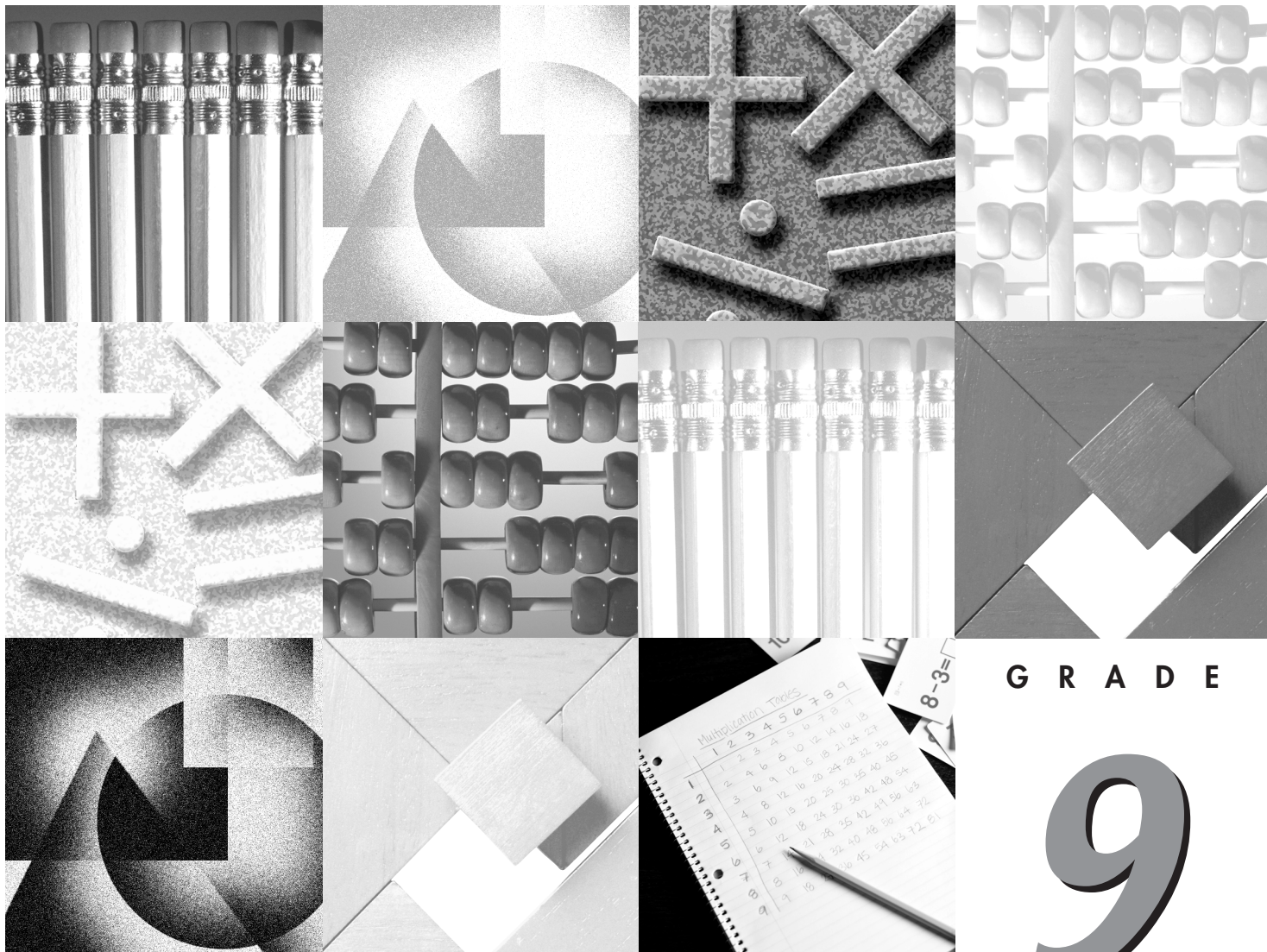


2003

FCAT

Florida Comprehensive Assessment Test



G R A D E

9

Mathematics

S A M P L E T E S T B O O K

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. The FCAT mathematics sample test materials for Grade 9 are composed of the books described below:

- Sample Test 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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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.

Directions for the 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.

Mathematics Sample Test Page 9

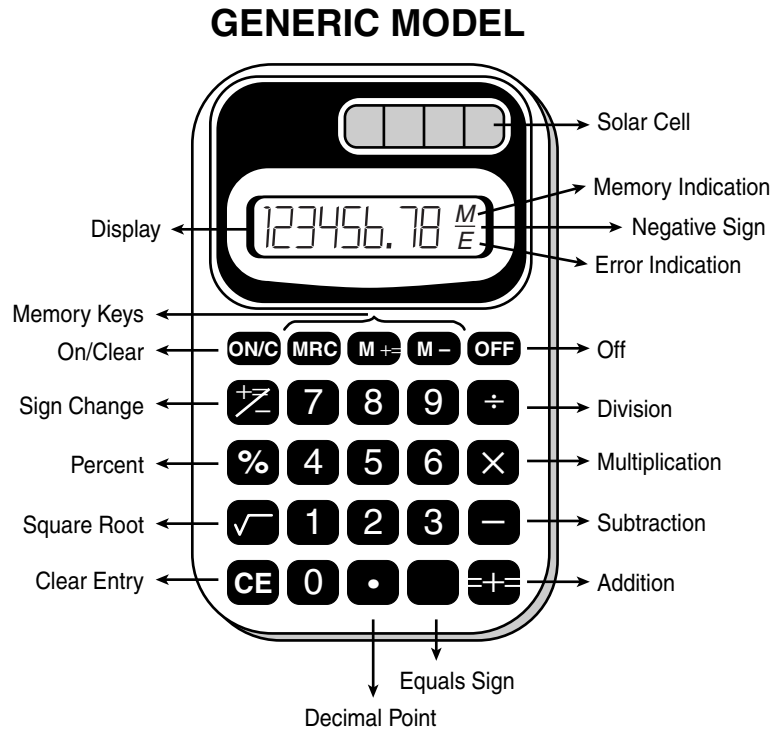
The Mathematics Sample Test consists of 15 practice questions that are similar to questions on FCAT. It includes a perforated (tear out) Mathematics Reference Sheet found on page 11.

Mathematics Sample Answer Sheet Page 25

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



HELPFUL HINTS FOR TAKING THE FCAT MATHEMATICS TEST

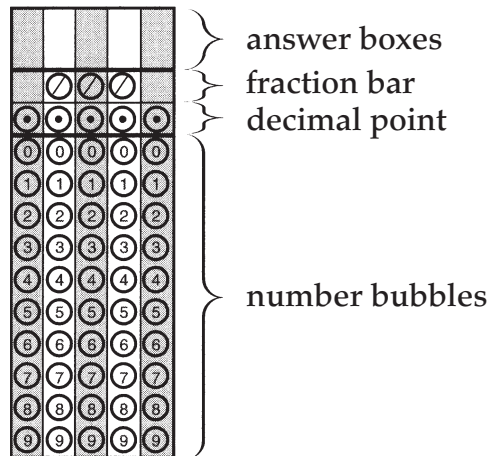
1. Read the problem very carefully. Then decide whether or not you need the calculator to help you solve the problem.
2. When starting a new problem, always clear your calculator by pressing the clear key.
3. If you see an **E** in the display, clear the error before you begin.
4. If you see an **M** 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. 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:



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			
/	/	/		
•	•	•	•	•
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
8	8	8	8	8
9	9	9	9	9

OR

			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
8	8	8	8	8
9	9	9	9	9

Decimal

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

5	.	0	6	
/	/	/		
•	•	•	•	•
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
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

OR

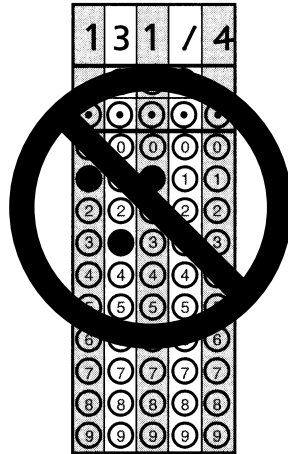
5	.	0	6	
/	/	/		
•	•	●	•	•
0	0	0	●	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	●	5	5	5
6	6	6	6	●
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

Fraction

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.

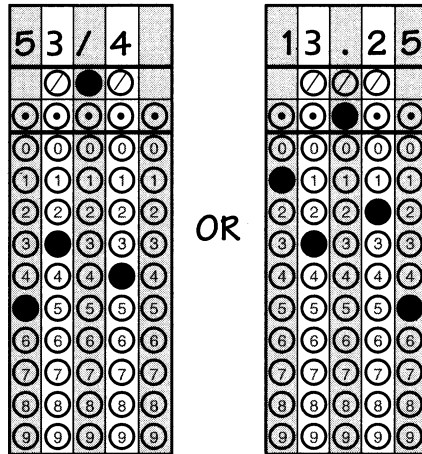
INCORRECT

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



CORRECT

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



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	●	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

$$n > 18.8$$

$$n < 19.2$$

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	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	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.

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

The Sample Test contains the Reference Sheet and 15 questions. It should take about 15 to 20 minutes to answer all the questions. You will mark your answers on the Sample Answer Sheet on page 25 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.

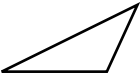




Mathematics
Sample
Test



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Grades FCAT Mathematics Reference Sheet






Fold and Tear Carefully Along Dotted Line

		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

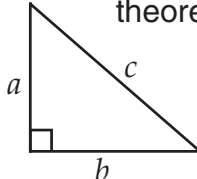
$$C = \pi d = 2\pi r$$

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

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 $\frac{180(n - 2)}{n}$.

 <p>Pythagorean theorem: $c^2 = a^2 + b^2$</p>	<p>Distance between two points $P_1(x_1, y_1)$ and $P_2(x_2, y_2)$:</p> $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
$y = mx + b$ <p>Slope-intercept form of an equation of a line, where m = slope and b = the y-intercept.</p>	<p>Midpoint between two points $P_1(x_1, y_1)$ and $P_2(x_2, y_2)$:</p> $\left(\frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2} \right)$
$d = rt$ <p>Distance, rate, time formula, where d = distance, r = rate, t = time.</p>	$I = prt$ <p>Simple interest formula, where p = principal, r = rate, t = time.</p>

Fold and Tear Carefully Along Dotted Line

Conversions

1 yard = 3 feet = 36 inches
 1 mile = 1,760 yards = 5,280 feet
 1 acre = 43,560 square feet
 1 hour = 60 minutes
 1 minute = 60 seconds

1 cup = 8 fluid ounces
 1 pint = 2 cups
 1 quart = 2 pints
 1 gallon = 4 quarts

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 pound = 16 ounces
 1 ton = 2,000 pounds

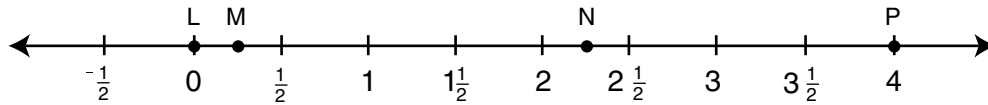
Metric numbers with four digits are presented without a comma (e.g., 9960 kilometers). For metric numbers greater than four digits, a space is used instead of a comma (e.g., 12 500 liters).

- 1 An influenza virus is 0.00000012 meter in diameter.

Which of these expresses this distance in scientific notation?

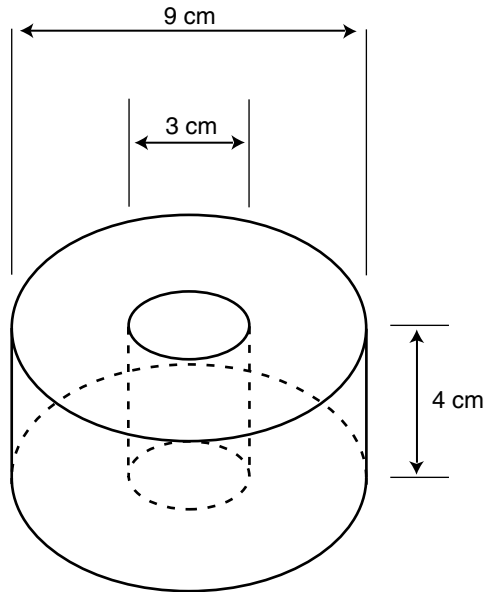
- A. 1.2×10^{-6}
- B. 1.2×10^{-7}
- C. 12×10^{-6}
- D. 12×10^{-7}

- 2 Which point on the number line represents a number that has a square root greater than itself?



- E. L
- G. M
- H. N
- I. P

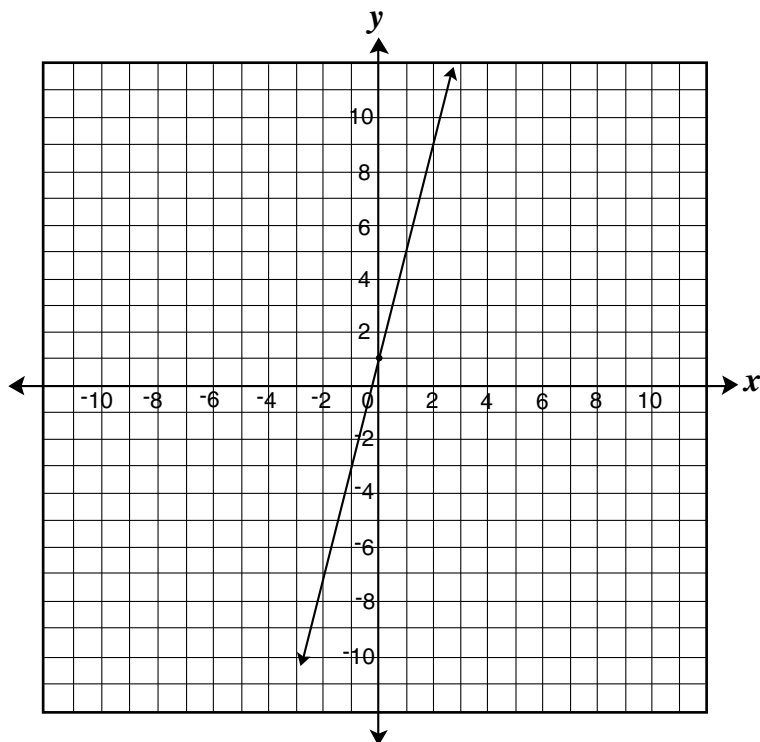
- 3 An engineer is designing a metal gasket for a spacecraft. The gasket has the shape of a cylinder with a cylindrical hole through its center. The diameter of the gasket is 9 centimeters, and its height is 4 centimeters. The diameter of the hole is 3 centimeters.



What volume of metal, in cubic centimeters, will be required to make the gasket?

- A. 16π cubic centimeters
- B. 72π cubic centimeters
- C. 81π cubic centimeters
- D. 108π cubic centimeters

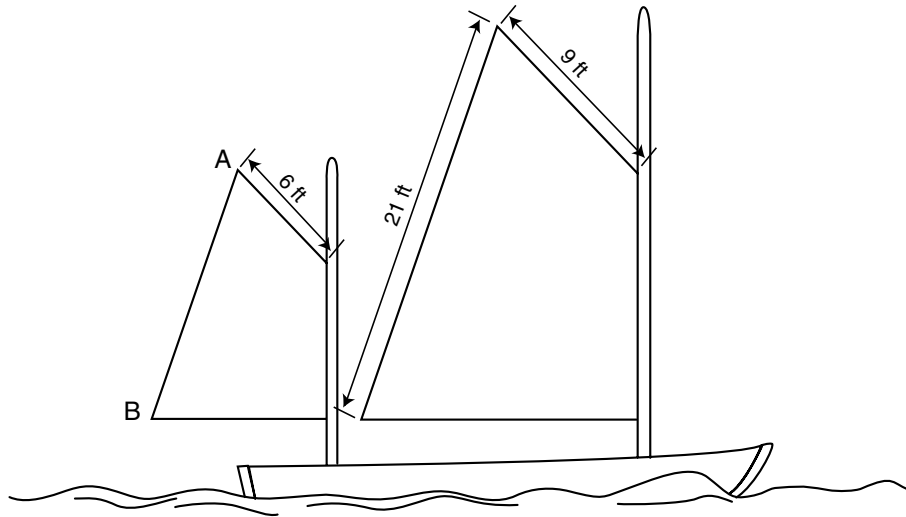
- 4 The graph of $y = 4x + 1$ is shown.



How would the graph change if the 4 in the equation were replaced with a 2?

- F. The line would be parallel with a shift up of 2 units.
- G. The line would be parallel with a shift down of 2 units.
- H. The line would have a greater slope, but it would pass through the y -axis at the same point.
- I. The line would have a lesser slope, but it would pass through the y -axis at the same point.

- 5 The two sails on the boat in the diagram are similar.



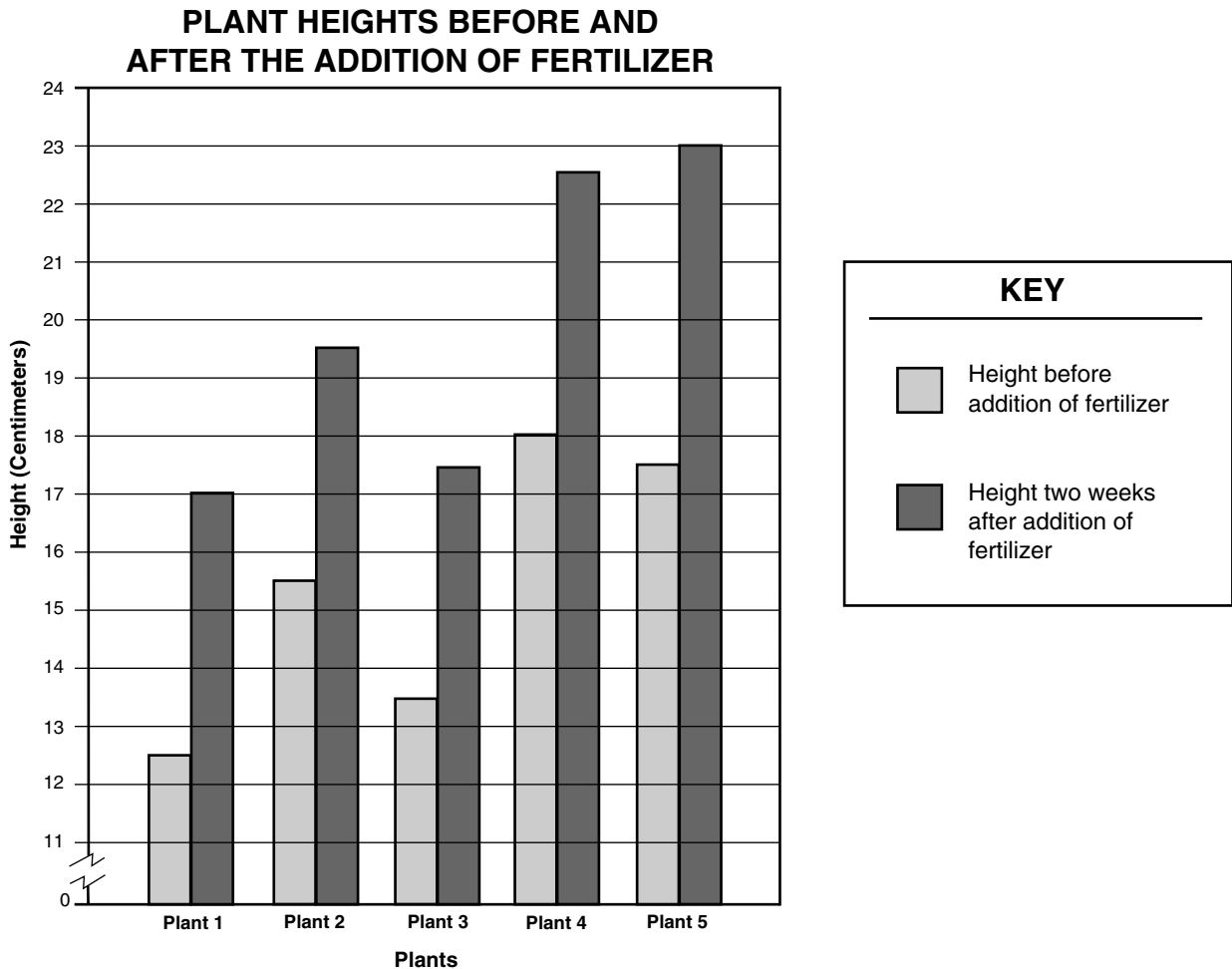
What is the length of \overline{AB} to the nearest foot?

- 6 A surveyor's chain is a device used by surveyors to measure land. A surveyor's chain is exactly 22 yards long.



A surveyor measures one side of a ranch to be 75 chains long. What is this distance in feet?

- 7 The owner of a plant nursery wanted to test the effectiveness of a new type of fertilizer. He measured the heights of 5 plants, and then gave each an equal amount of the fertilizer. Two weeks later, he measured the heights of the plants again. The graph shows the heights of the plants before and after the addition of fertilizer.



What was the **mean** growth of the plants, to the nearest tenth of a centimeter?

- 8 The table shows the mean number of points scored per game by four professional basketball players in four seasons.

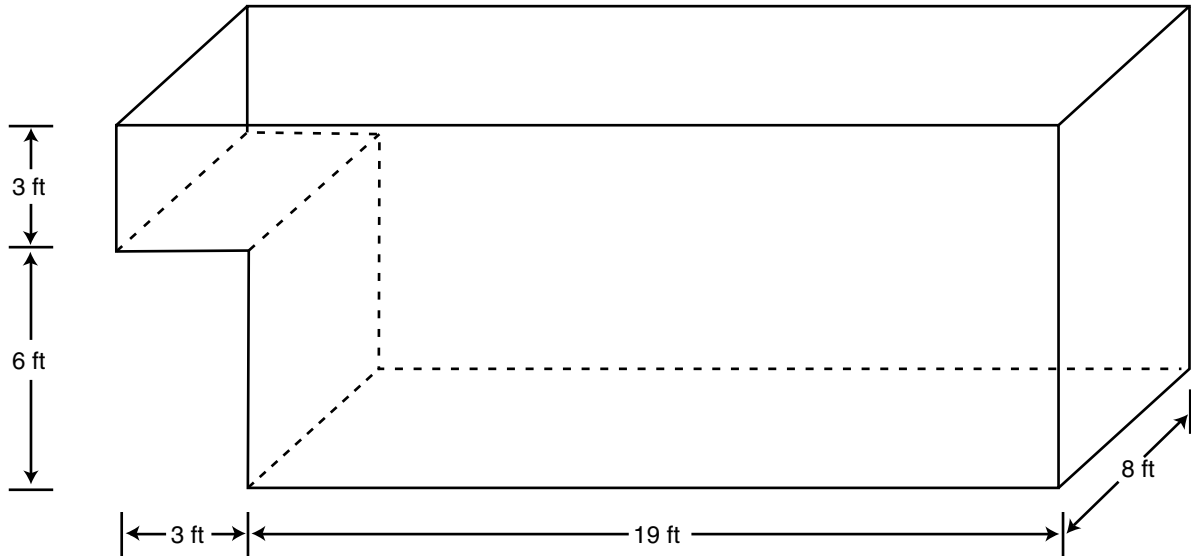
MEAN POINTS SCORED PER GAME

Player	Season			
	1998–1999	1997–1998	1996–1997	1995–1996
Alonzo Mourning	20.1	19.2	19.8	23.2
Tim Hardaway	17.4	18.9	20.3	17.2
Jamal Mashburn	14.8	15.1	13.4	10.6
Terry Mills	9.0	4.2	10.8	9.4

Which player had the greatest **range** of mean points per game for the seasons shown in the table?

- A. Alonzo Mourning
- B. Tim Hardaway
- C. Jamal Mashburn
- D. Terry Mills

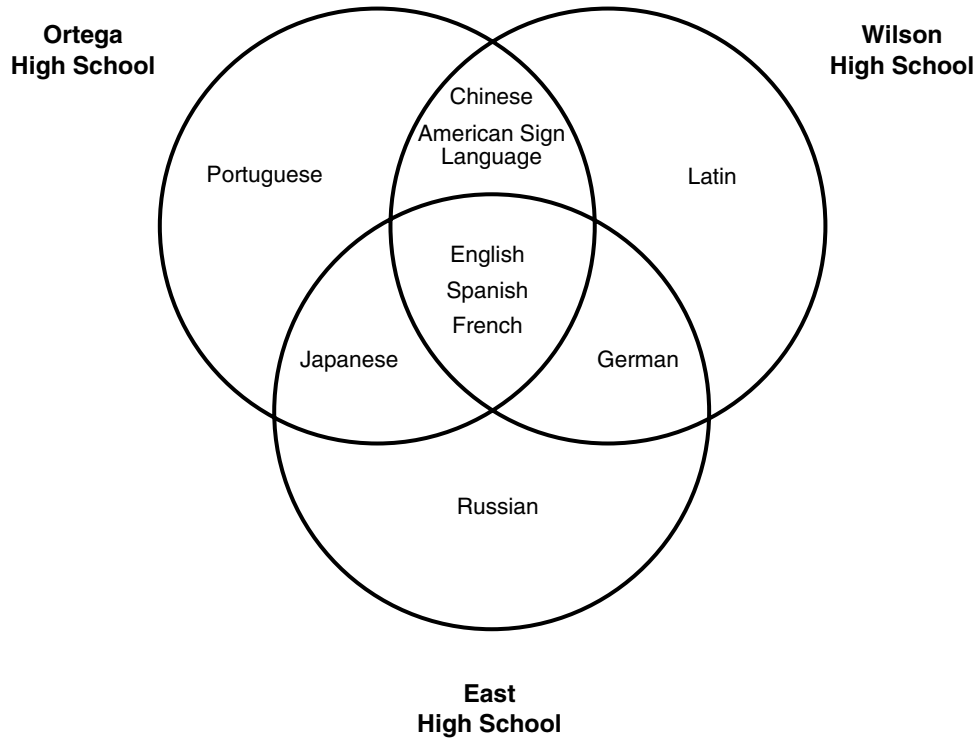
- 9 The diagram shows the dimensions of the cargo area of a moving van.



What is the maximum volume of cargo, in cubic feet, that can fit in the van?

- E. 892 cubic feet
- G. 1,368 cubic feet
- H. 1,440 cubic feet
- I. 1,584 cubic feet

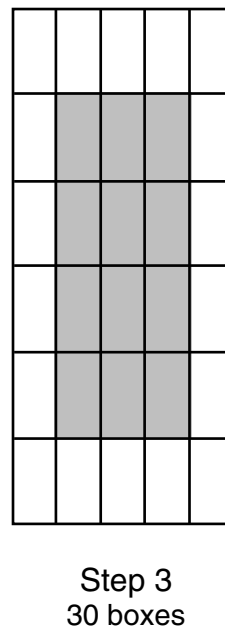
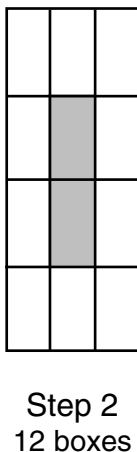
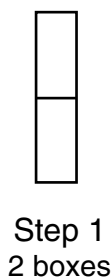
- 10 The Venn diagram shows the languages that are taught at three high schools.



How many languages are taught at both Wilson High School and Ortega High School?

- A. 2
- B. 4
- C. 5
- D. 9

- 11** Will is making a display of oatmeal boxes near the entrance of a grocery store. Each box takes up 15 square inches of floor space. Will begins by placing two boxes on the floor (Step 1). Then he completely surrounds these boxes with more boxes (Step 2). The diagram shows the first 3 steps as seen from above.

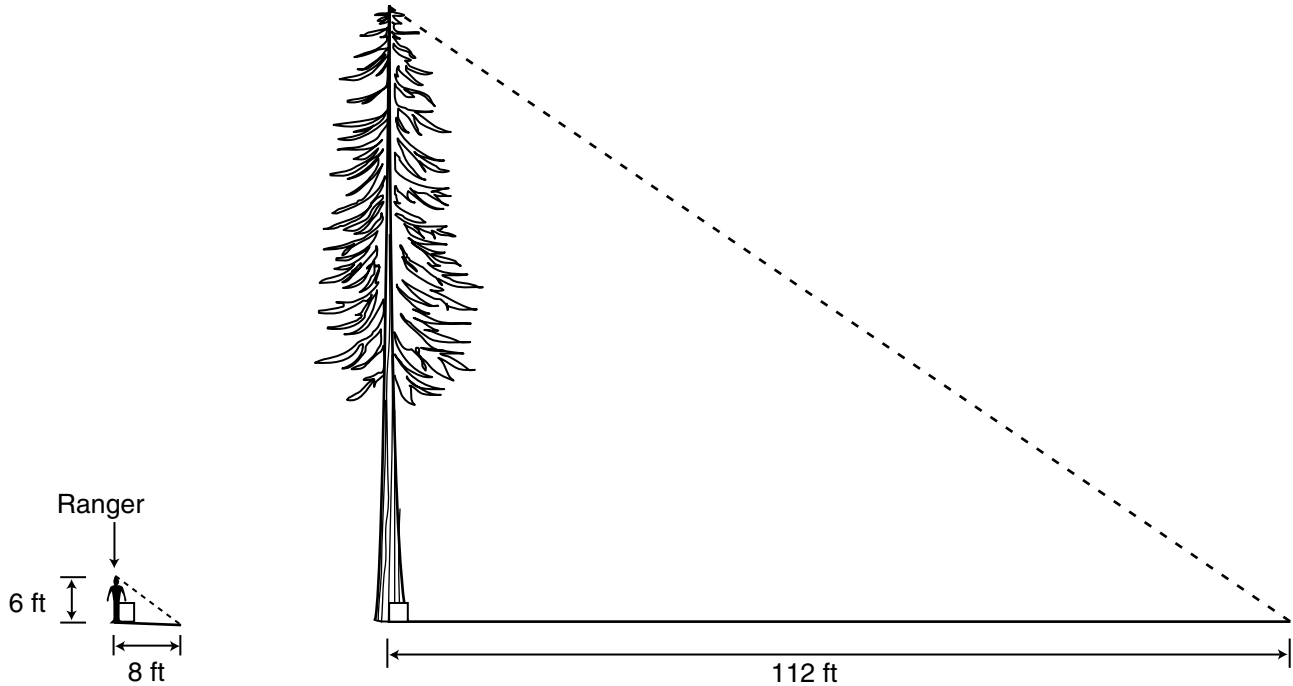


What area of the floor, **in square inches**, will the display occupy in Step 4?

- 12** At a used book store, all books are normally sold at $\frac{1}{2}$ off the cover price. This weekend, however, the store will take an additional 20% off the reduced price. During the weekend sale, John selects a book with a cover price of \$12.

How much will John pay for the book, not including sales tax?

- 13 A 6-foot tall forest ranger used shadows to approximate the height of a large tree. At a time when the shadow of the tree was 112 feet long, the ranger's shadow was 8 feet long.

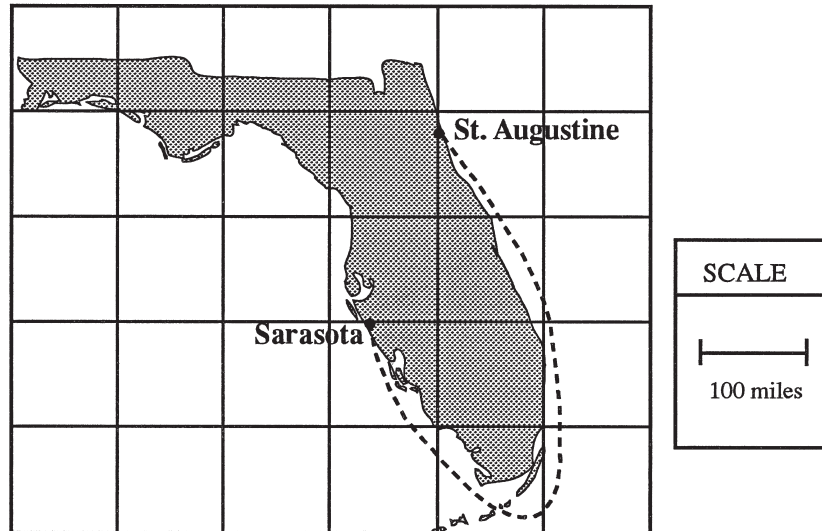


What is the approximate height of the tree in feet?

- F. 84 feet
- G. 110 feet
- H. 140 feet
- I. 149 feet



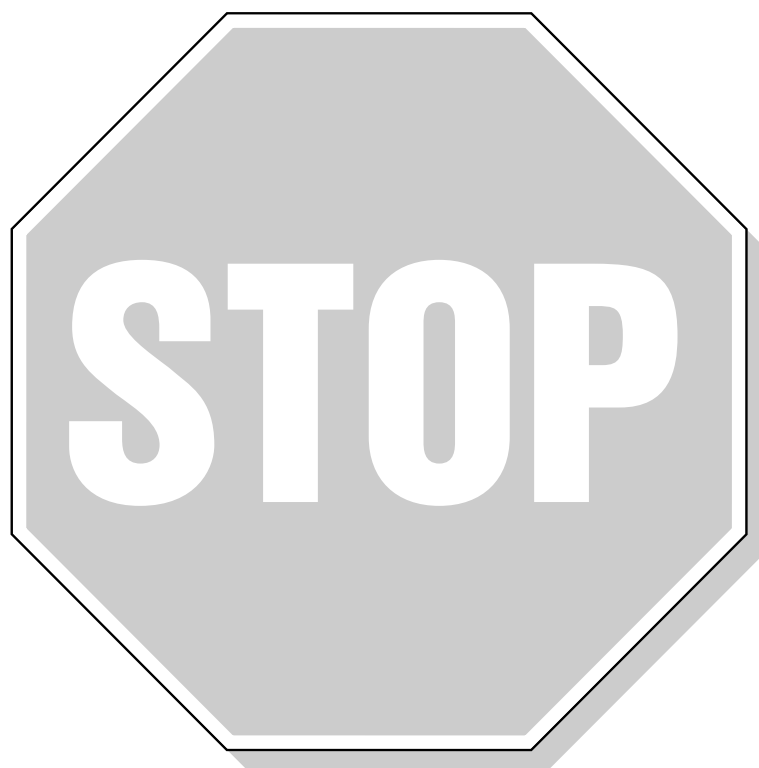
- 14 The Ashkar family plans to sail from St. Augustine to Sarasota using the route shown on the map below.



What is the best estimate of the number of miles needed to sail the route shown?

- A. 1,000 miles
 - B. 800 miles
 - C. 600 miles
 - D. 400 miles
- 15 Samantha tosses 2 quarters and 3 pennies. What is the probability that both quarters and at least one of the pennies will land heads up?

- F. $\frac{1}{32}$
- G. $\frac{3}{32}$
- H. $\frac{7}{32}$
- I. $\frac{21}{32}$



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 test book.

Blank Page

Fold and Tear Carefully Along Dotted Line



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ISBN 999-8171-74-1



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1 2 3 4 5 6 7 8 9 10 11 12 A B C D E