2011

FCAT

Florida Comprehensive Assessment Test®

Grade 10/Retake FCAT Mathematics Sample Questions

Student Name

The intent of these booklets is to orient teachers and students to the types of questions on the 2011 Grade 10 and the Retake FCAT tests. By using these materials, students will become familiar with the types of items and response formats that they will see on the actual test. The questions and answers are not intended to demonstrate the length of the actual test, nor should student responses be used as an indicator of student performance on the actual test. Additional information about the mathematics test items can be found in the 2005 *FCAT Test Item Specifications* at http://fcat.fldoe.org/fcatis01.asp and previously released FCAT tests at http://fcat.fldoe.org/fcatrelease.asp.

Grade 10 students taking the 2011 FCAT Mathematics test and all Retake students taking the FCAT Mathematics test will be taking the computer-based test (CBT) using the TestNav platform. Only students requiring accommodations will use the paper-based test.

The 2011 FCAT Mathematics test for students in Grade 10 that will be used to calculate student results and school grades in 2011 will be composed of items that assess mastery of the 1996 Sunshine State Standards. For Grades 3 through 8, the 2011 FCAT 2.0 Mathematics tests and sample questions and answers are based on the 2007 Next Generation Sunshine State Standards.

Directions for Answering the Mathematics Sample Questions

Mark your answers in this booklet. If you don't know how to work a problem, ask your teacher to explain it to you. Your teacher has the answers to the sample questions.

The sample questions for students and the sample answers for teachers will only be available online at: http://fcat.fldoe.org/fcatsmpl.asp.

You may need formulas and conversions to help you solve some of the problems. You may refer to the Reference Sheet on pages 5 and 6 as often as you like.

Use the space in your Mathematics Sample Questions booklet to work on the multiple-choice and gridded-response questions.

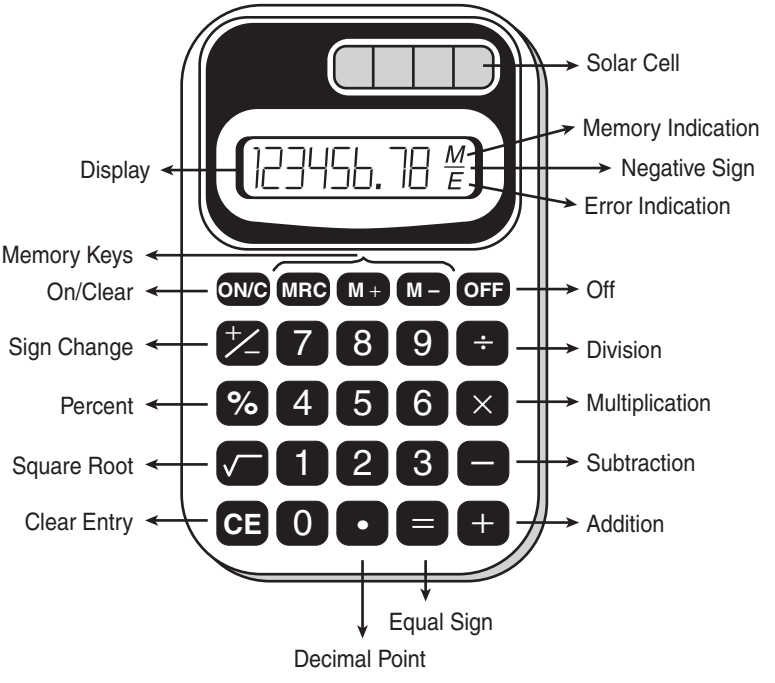
FCAT Question Symbol

This symbol appears next to questions that require you to fill in your answer on a grid. There may be more than one correct way to fill in a response grid. You MUST fill in the bubbles accurately to receive credit for your answer. A correct answer to each of these questions is worth 1 point.

Helpful Hints for Taking the FCAT Mathematics Test

1) When starting a new problem, always clear your calculator by pressing the On/Clear key.
2) If you see an **E** in the display, clear the error before you begin.
3) If you see an **M** in the display, clear the memory and the calculator before you begin.
4) Remember, your calculator will NOT automatically perform the algebraic order of operations.
5) The negative sign may appear either to the left or to the right of the number.
6) When solving any mathematics item, do not round decimal equivalents and/or approximations until the final step of the item or task. Focus on whether the item specifies the decimal place, equivalent fraction, and/or *pi* approximation needed for the answer. In most cases, front-end estimation and truncation are not accurate processes for estimation.

CALCULATOR MODEL

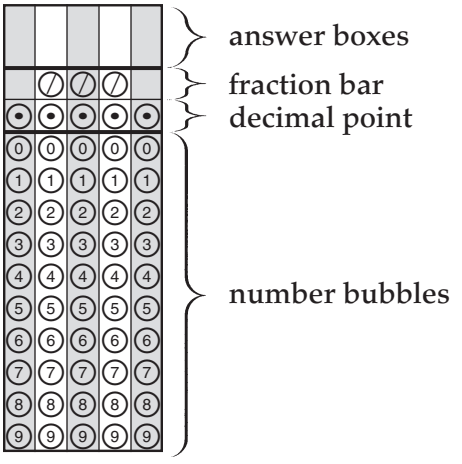


The hand-held calculator shown above will be used by students taking the paper-based FCAT Mathematics test. Students taking the computer-based test (CBT) will use the Texas Instruments (TI) 108 emulator. Online practice using the TI 108 is available on TestNav for all students.

How to Complete the Grade 10/Retake Response Grid

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

The Grade 10/Retake response grid has the following parts:

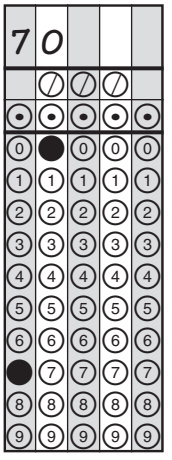


Directions

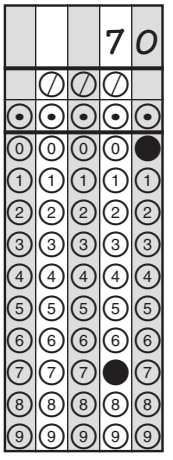
1. Work the problem and find an answer.
2. Write your answer in the answer boxes at the top of the grid.
   - Print your answer with the first digit in the left answer box OR with the last digit in the right answer box.
   - Print only one digit or symbol in each answer box. Do NOT leave a blank answer 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.

Whole Number

$60 + 10 =$

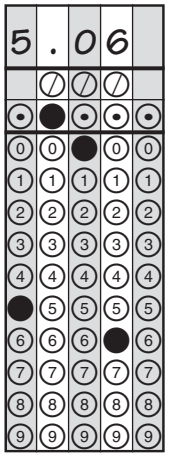


OR

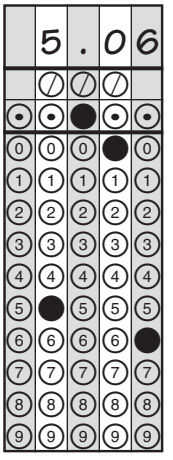


Decimal

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



OR



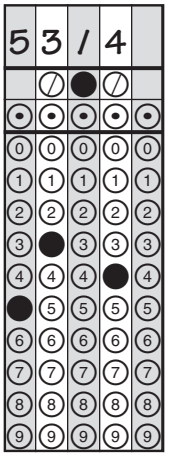
Decimal or Fraction

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

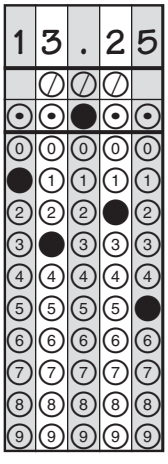
You may NOT write a **mixed number** such as $13\frac{1}{4}$ in the answer grid. If your answer is a mixed number, you must convert the answer to an improper fraction, such as $\frac{53}{4}$, or to a decimal number, such as 13.25. If you tried to fill in $13\frac{1}{4}$, it would be read as $\frac{131}{4}$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

CORRECT

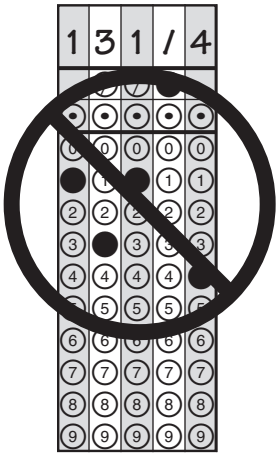
$12\frac{3}{4} + \frac{1}{2} =$



OR

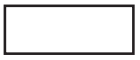


INCORRECT



Grade 10/Retake FCAT Mathematics Reference Sheet

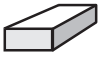
Area

	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 $C = 2\pi r$

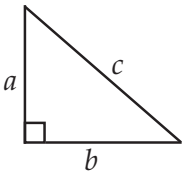
		Volume/Capacity	Total Surface Area
	Right Circular Cone	$V = \frac{1}{3}\pi r^2 h$	$S.A. = \frac{1}{2}(2\pi r)\ell + \pi r^2$ or $S.A. = \pi r\ell + \pi r^2$
	Right Square Pyramid	$V = \frac{1}{3}lwh$	$S.A. = 4(\frac{1}{2}l\ell) + l^2$ or $S.A. = 2l\ell + l^2$
	Sphere	$V = \frac{4}{3}\pi r^3$	$S.A. = 4\pi r^2$
	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 $\frac{180(n-2)}{n}$.

Grade 10/Retake FCAT Mathematics Reference Sheet

Pythagorean theorem:



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

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.

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 $P_2 (x_2, y_2)$:

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

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

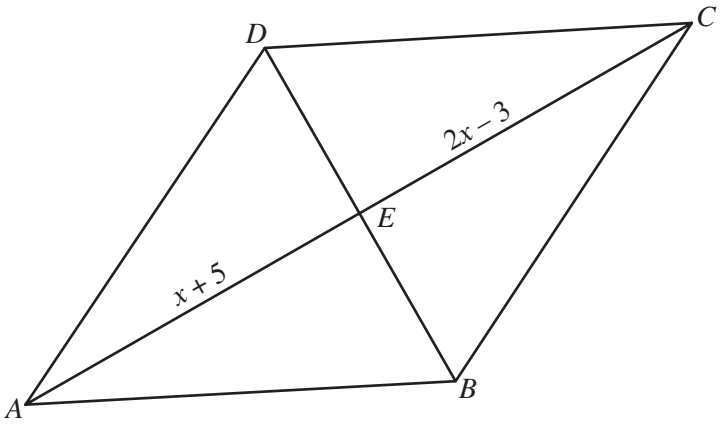
1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts

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 = 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 Figure $ABCD$ is a rhombus. The length of $\overline{AE}$ is $(x + 5)$ units, and the length of $\overline{EC}$ is $(2x - 3)$ units.



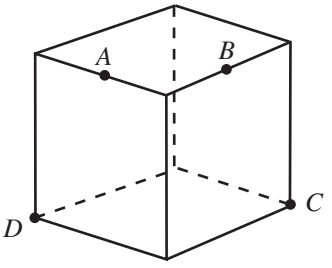
Which statement best explains why the equation $x + 5 = 2x - 3$ can be used to solve for x ?

Ⓐ All four sides of a rhombus are congruent.
Ⓑ Opposite sides of a rhombus are parallel.
Ⓒ Diagonals of a rhombus are perpendicular.
Ⓓ Diagonals of a rhombus bisect each other.

2 Kendra has a compost box that has the shape of a cube. She wants to increase the size of the box by extending every edge of the box by half of its original length. After the box is increased in size, which of the following statements is true?

Ⓕ The volume of the new compost box is exactly 112.5% of the volume of the original box.
Ⓖ The volume of the new compost box is exactly 150% of the volume of the original box.
Ⓗ The volume of the new compost box is exactly 337.5% of the volume of the original box.
Ⓘ The volume of the new compost box is exactly 450% of the volume of the original box.

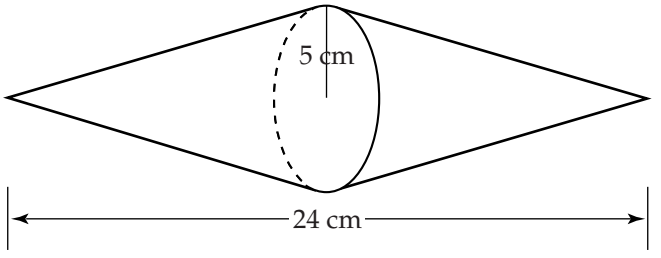
3 A potter is cutting a cube-shaped block of clay with a wire. She cuts through points *A*, *B*, *C*, and *D* so that the cross section is a plane.



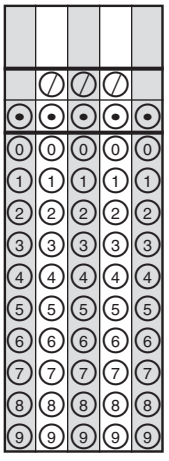
What is the shape of the cross section?

Ⓐ pentagon
Ⓑ rectangle
Ⓒ trapezoid
Ⓓ triangle

4 Two identical right circular cones have been placed with their bases touching to create the sculpture shown in the drawing below. The radius of each base is 5 centimeters (cm), and the total length of the sculpture is 24 cm.

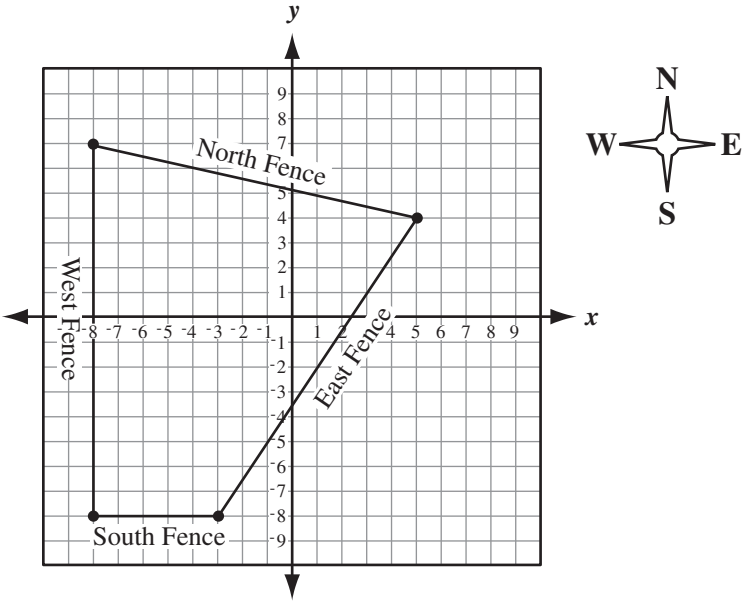


What is the volume, in cubic centimeters, of the sculpture? Use one of the approximations for π found on the Grade 10/Retake FCAT Mathematics Reference Sheet.

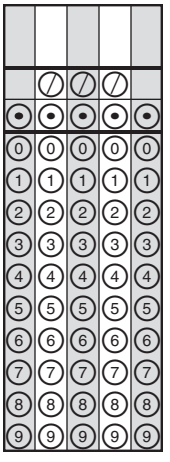


5 The boundaries of a section of Anita's ranch are plotted on the coordinate plane below. Each vertex on the grid has integer coordinates.

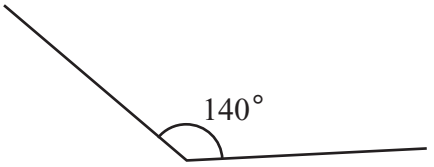
RANCH BOUNDARIES



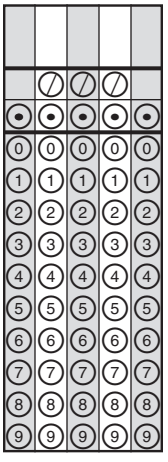
What is the slope of the segment that represents the east fence on the graph?



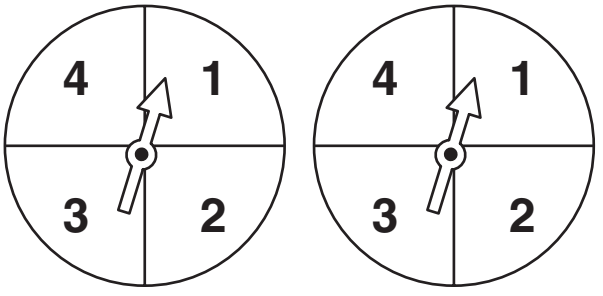
6 Claire is drawing a regular polygon. She has drawn two of the sides with an interior angle of 140°, as shown below.



When Claire completes the regular polygon, what should be **the sum**, in degrees, of the measures of the interior angles?



7 Jesse and Jordan are playing a game using two spinners. Each spinner contains the numbers 1, 2, 3, and 4, and each spinner is equally likely to stop on any of the four numbers.



In the game, a player spins both spinners and calculates the product of the two numbers on which the spinners stop. What **product** has the greatest probability of occurring in this game?

Ⓕ 4

Ⓖ 8

Ⓗ 12

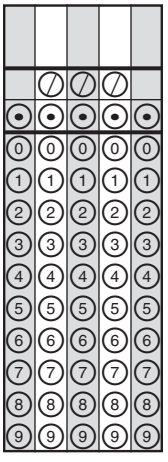
Ⓘ 16

8 A wholesaler is offering two different package deals of roses and carnations to florists. One package contains 20 dozen roses and 34 dozen carnations for $504.00. The other package contains 15 dozen roses and 17 dozen carnations for $327.00. This information can be represented by the system of equations below, where r represents the cost of one dozen roses and c represents the cost of one dozen carnations.

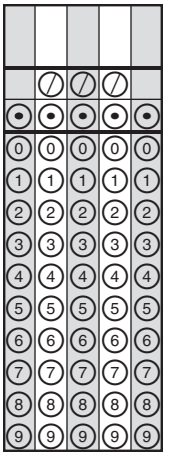
$$20r + 34c = 504$$

$$15r + 17c = 327$$

What is the cost, in dollars, of one dozen roses?

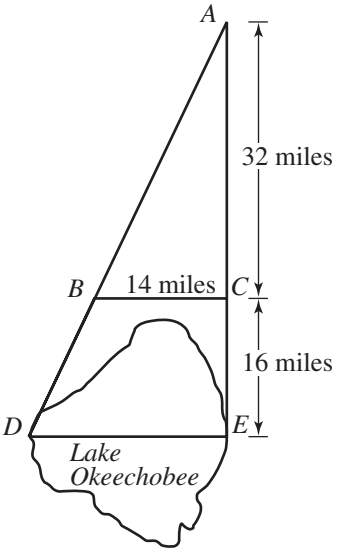


9 An electrician charges a $45 fee to make a house call plus an hourly rate for labor. If the electrician works at one house for 3 hours and charges $145.50 for the job, what is the electrician's hourly rate?

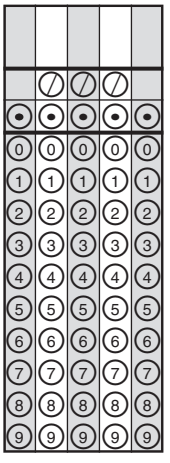


10 A geographer is trying to determine the distance across Lake Okeechobee from point D to point E, as shown in the diagram below. Point C is on $\overline{AE}$ and point B is on $\overline{AD}$. She has drawn triangles using known distances so that $\angle ACB$ is congruent to $\angle AED$.

Lake Okeechobee



What is the distance, in miles, across Lake Okeechobee along $\overline{DE}$?



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The Florida Department of Education and its test contractors currently employ strategies to protect the environment in the production and destruction of FCAT materials. The Department encourages schools and districts to recycle non-secure FCAT interpretive publications after use.

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