

# COUNTDOWN



**TO FCAT  
2008**

# Overview

## *What is this, and how am I supposed to use it?*

The information included in this file provides a comprehensive model for FCAT review over a 40 day period by following the pattern below:

*Number Sense A Day 1: One MC and one GR warm-up problem*

*Number Sense A Day 2: One MC and one GR warm-up problem*

*Number Sense A Day 3: One MC and one GR warm-up problem*

*Number Sense A Day 4: One SR/ER warm-up problem*

*Repeat this process on B Days and for the other strands as well.*

This model is designed to cover key (or sometimes overlooked) FCAT topics through warm-up problems. While this model has proven successful at several schools in the district, *it's not meant to be a 100% cure for all FCAT woes*. What is intended is that everything from a plan of attack, to identification of typical problem areas, as well as sample problems for each area have been developed and combined into one easy-to-use document. This is NOT REQUIRED. It's being offered as a possible tool to be used in the coming months.

**Here's what's in the document:**

### The Calendar:

- ramp-up schedule begins on January 7<sup>th</sup> and ends on March 4<sup>th</sup>
- includes 40 focus days
- 8 (four A and four B) days per FCAT strand
- click on the name of the strand in the calendar to be taken to a list of topics for the strand

### The Strands:

- choose from 6 common topics/problem areas for each strand
- listed by type of content rather than standard code
- click the name of the topic to be taken to sample problems for that topic

### The Topics (sub-strands):

- 1 multiple choice, 1 gridded response, and 1 short/extended response problem available
- problems aligned with specific FCAT content specifications

**Here's what's not in the document:**

- Student Packets have been developed that follow the pattern listed above. They follow the calendar and include correct dates and workspaces for the types of problems suggested on a given day.

# January 2008

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7 (A Day) <b>Number Sense</b>	8 (B Day) <b>Number Sense</b>	9 (A Day) <b>Number Sense</b>	10 (B Day) <b>Number Sense</b>	11 (A Day) <b>Number Sense</b>	12
13	14 (B Day) <b>Number Sense</b>	15 (A Day) <b>Number Sense</b>	16 (B Day) <b>Number Sense</b>	17 (A Day) <b>Measurement</b>	18	19
20	21	22 (B Day) <b>Measurement</b>	23 (A Day) <b>Measurement</b>	24 (B Day) <b>Measurement</b>	25 (A Day) <b>Measurement</b>	26
27	28 (B Day) <b>Measurement</b>	29 (A Day) <b>Measurement</b>	30 (B Day) <b>Measurement</b>	31 (A Day) <b>Geometry</b>		

# February 2008

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1 (B Day) <b>Geometry</b>	2
3	4 (A Day) <b>Geometry</b>	5 (B Day) <b>Geometry</b>	6 (A Day) <b>Geometry</b>	7 (B Day) <b>Geometry</b>	8 (A Day) <b>Geometry</b>	9
10	11 (B Day) <b>Geometry</b>	12 (A Day) <b>Algebraic Thinking</b>	13 (B Day) <b>Algebraic Thinking</b>	14 (A Day) <b>Algebraic Thinking</b>	15 (B Day) <b>Algebraic Thinking</b>	16
17	18 (A Day) <b>Algebraic Thinking</b>	19 (B Day) <b>Algebraic Thinking</b>	20 (A Day) <b>Algebraic Thinking</b>	21 (B Day) <b>Algebraic Thinking</b>	22 (A Day) <b>Data Analysis and Probability</b>	23
24	25 (B Day) <b>Data Analysis and Probability</b>	26 (A Day) <b>Data Analysis and Probability</b>	27 (B Day) <b>Data Analysis and Probability</b>	28 (A Day) <b>Data Analysis and Probability</b>	29 (B Day) <b>Data Analysis and Probability</b>	

# March 2008

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3 ( <i>A Day</i> ) <b>Data Analysis and Probability</b>	4 ( <i>B Day</i> ) <b>Data Analysis and Probability</b>	5	6	7	8
9	10	11	12 <b>FCAT Testing Begins</b>	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

# Number Sense Topics

Basic Operations

Classifying Numbers

Estimation

Percents

Scientific Notation

Radicals

## Number Sense Problems

### Basic Operations

#### **Multiple Choice:**

Which of the following expressions is equivalent to  $3(6 - 8)^3 + (-2)^2(-3)$ ?

- A. 36            C. -12  
B. 12            D. -36

#### **Gridded Response:**

If  $x = -3$ ,  $y = \frac{1}{2}$ , and  $z = 2$ , what is the value of  $3x - 4z + 4y^2$ ?

#### **Short/Extended Response:**

The volume of a right circular cone is  $V = \frac{1}{3}\pi r^2 h$  where  $h$  is its height. For  $r = 4$  and  $h = 5$ , complete the following:

*Part A:* Find the volume of the cone in terms of  $\pi$ .

*Part B:* Use 3.14 for  $\pi$  and find the volume of the cone to the nearest hundredth

## Number Sense Problems

### Classifying Numbers

#### **Multiple Choice:**

If  $x = \sqrt{36y}$ , which value of  $y$  will give a rational value for  $x$ ?

A.  $\frac{1}{2}$       C.  $\frac{1}{4}$

B.  $\frac{1}{3}$       D.  $\frac{1}{6}$

#### **Gridded Response:**

On a number line, which integer is between the irrational numbers  $\sqrt{85}$  and  $\sqrt{114}$ ?

#### **Short/Extended Response:**

Complete the following for the numbers  $-2$ ,  $\sqrt{17}$ ,  $\pi$ ,  $|-3|$ , and  $\frac{13}{4}$ :

*Part A:* Classify each number as rational or irrational

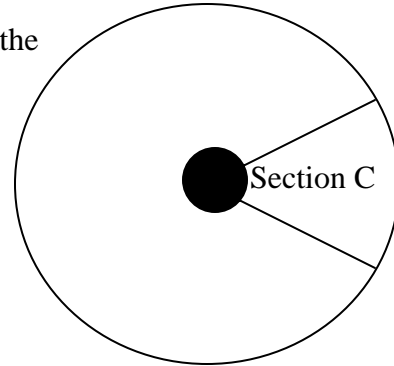
*Part B:* Place each number in the correct position on a number line

## Number Sense Problems

### Estimation/Reasonable Results

#### Multiple Choice:

The director of the Theater in the Round is estimating that the number of people in attendance at a play. The people are evenly distributed throughout the theater. There are approximately 60 people sitting in Section C. What is the approximate number of people in attendance?



- A. 290 people
- B. 350 people
- C. 410 people
- D. 470 people

#### Gridded Response:

After delivering 25 newspapers, Art had fewer than 60 left. At most, how many newspapers did he have originally?

#### Short/Extended Response:

A gallon of paint covers between 350 and 400 square feet of surface. Hector wants to paint the 4 walls of his bedroom. Two of the walls are 9 feet by 10 feet, and the other two are 9 feet by 15 feet. He calculates that he needs to buy one gallon of paint. Are his calculations correct? Why or why not?

## Number Sense Problems

### Percentages

#### **Multiple Choice:**

The trip from Tallahassee to Key West is 640 miles. Approximately, what percent of the trip is completed after driving 350 miles?

- A. 51%
- B. 53%
- C. 55%
- D. 57%

#### **Gridded Response:**

In order to regain a larger market share of auto sales, a car company decides to reduce the price of one of its cars from \$22,350 to \$19,221. What is the percent decrease?

#### **Short/Extended Response:**

During a sale, Ms. Chin was asked to reduce the price of certain items. On Wednesday morning, she marked an \$80 dress down 10%. On Thursday morning, she marked the price of the same dress down another 20%. On Friday morning, she marked the price of the same dress down another 40%.

*Part A:* Determine the price of the dress on Wednesday, Thursday, and Friday

*Part B:* What is the total percentage change of the dress from Tuesday to Friday?

## Number Sense

### Scientific Notation Problems

#### **Multiple Choice:**

At its farthest point of orbit, Mercury is 69, 800, 000 kilometers from the sun. What is the scientific notation for this distance?

- A.  $69.8 \times 10^6$       C.  $6.98 \times 10^6$   
B.  $69.8 \times 10^7$       D.  $6.98 \times 10^7$

#### **Gridded Response:**

A micrometer is an instrument that can be used to measure the thickness of metal. A particular piece of metal is 0.0057 centimeter thick. How many spaces would the decimal have to be moved in order to convert this measurement into proper scientific notation?

#### **Short/Extended Response:**

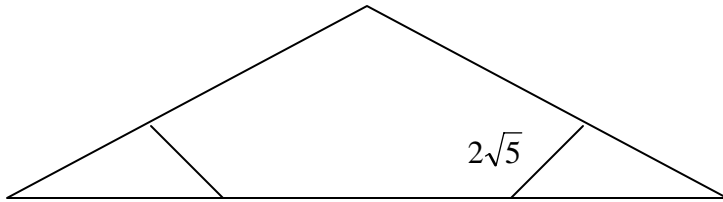
Simplify the following expression and give your answer in correct scientific notation. Show and/or explain your work.

$$(8.7 \times 10^{14}) \times (4.25 \times 10^{-8})$$

## Number Sense Problems Radicals

### Multiple Choice:

A support for a roof truss is  $2\sqrt{5}$  feet long.



Which of the following is the same measurement?

- A.  $5\sqrt{2}$  feet      C.  $\sqrt{20}$  feet  
B.  $\sqrt{10}$  feet      D. 10 feet

### Gridded Response:

Use your calculator to find the decimal approximation of the following expression. Round your answer to the nearest tenth.

$$2\sqrt{3} - (-3\sqrt{8}) + \frac{1}{2}\sqrt{2}$$

### Short/Extended Response:

Rationalize the following fraction, and give your answer in simplest form. Show/explain your work.

$$\frac{3\sqrt{6}}{\sqrt{2}}$$

# **Measurement Topics**

**2D/3D Measurements**

**Arcs and Angles in Circles**

**Area and Perimeter**

**Area by Dissection**

**Conversions**

**Rate, Time, and Distance**

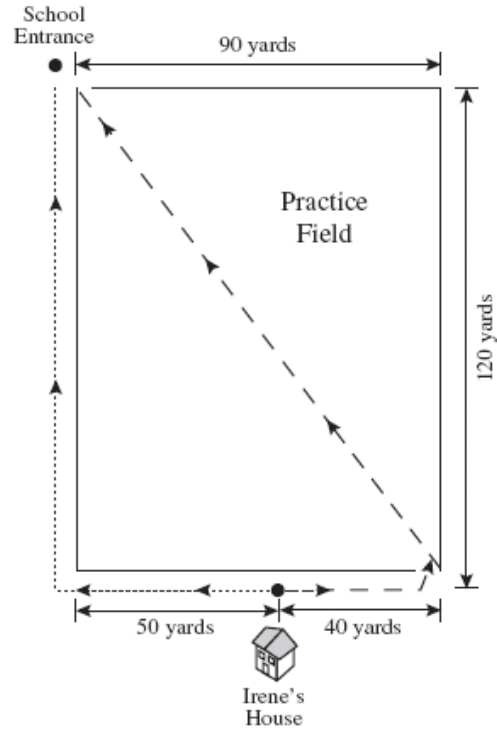
# Measurement

## 2D/3D Measurements

### Multiple Choice:

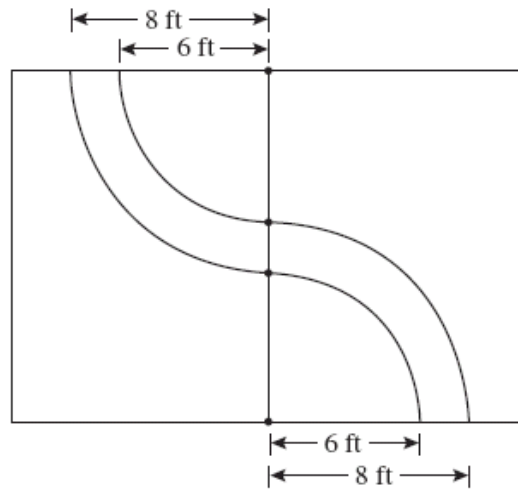
Irene's house is located near the perimeter fence of her school's rectangular practice field, as shown in the diagram to the right. There are two paths Irene can follow from her house to the entrance of her school (Path 1). She can walk along the fence that surrounds the practice field to get to the entrance of her school (Path 1). She can also go through the gate and cut across the practice field (Path 2). Which of the following statements comparing Irene's two paths to school is true?

- A. Path 2 is about 20 yards shorter.
- B. Path 2 is about 60 yards shorter.
- C. Path 1 is about 20 yards shorter.
- D. Path 1 is about 40 yards shorter.



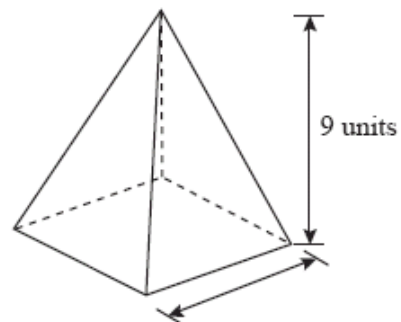
### Gridded Response:

Arthur is building a path through his garden. He will bend 4 thin pieces of wood into curves, as shown in the diagram to the right, and fill the space between the wood pieces with gravel. Each piece of wood will be bent into a quarter circle. What should be the total length, to the nearer foot, of all 4 pieces of wood?



### Short/Extended Response:

The right square pyramid to the right has a height of 9 units and a volume of 108 cubic units. What is the length, to the nearest unit, of one side of the base of the pyramid?



## Measurement Problems

### Arcs and Angles in Circles

#### Multiple Choice:

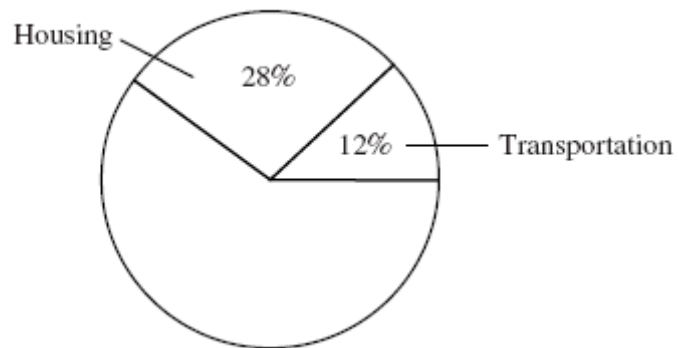
Rio de Janeiro, Brazil, is located at latitude  $22.9^\circ$  S. Green Bay, Wisconsin, is located at latitude  $45.5^\circ$  N. What is the angle measurement between the two cities?

- A.  $21.6^\circ$                       C.  $44.5^\circ$   
B.  $22.9^\circ$                       D.  $67.4^\circ$

#### Gridded Response:

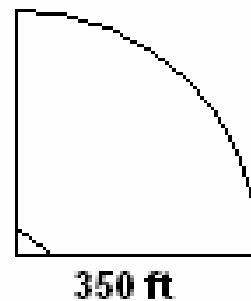
The circle graph to the right shows that 28% of the Walker family's monthly expenses is for housing and 12% is for transportation. How many **degrees greater** is the measure of the angle that represents housing than the measure of the angle that represents transportation?

WALKER FAMILY MONTHLY EXPENSES



#### Short/Extended Response:

A baseball field is in the shape of  $\frac{1}{4}$  of a circle. In spring training, the players begin practice by jogging around the field 3 times. How far does each player jog? Show all work necessary to find the answer.



## Measurement Problems

### Area and Perimeter

#### **Multiple Choice:**

A track is in the shape of a rectangle and two semi-circles. The rectangle is 4 yards by 10 yards. To the nearest yard, what is the perimeter of the track?



- A. 28 yards                      C. 40 yards  
B. 33 yards                      D. 80 yards

#### **Gridded Response:**

Sally is trying to determine the dimensions of the classroom. Since she doesn't have a yardstick, she paces the room off and finds that it is 15 paces wide and 23 paces long. She knows that her pace is equal to 15 inches. What is the area of the room to the nearest square foot?

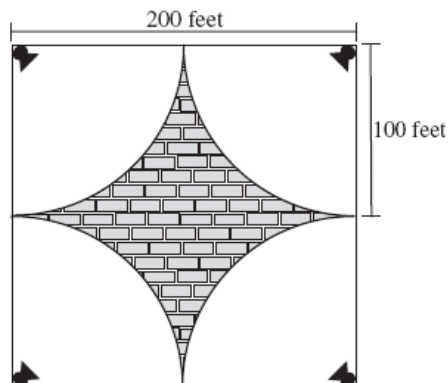
#### **Short/Extended Response:**

Students in a geometry class are cutting right triangles out of a rectangular piece of construction paper, as shown to the right. The base of the triangle is  $\frac{1}{5}$  the length of the rectangle. The area of the triangle is 21 square inches. What is the area of the rectangle?

## Measurement Problems Area by Dissection

### Multiple Choice:

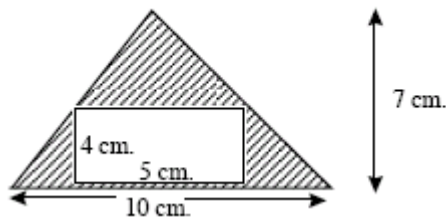
A water sprinkler was installed at each corner of the city park. A sketch of the square park is shown to the right. Each sprinkler can water exactly halfway down each side of the park. The sprinklers would not reach the shaded areas, as shown in the diagram, so the city decided that bricks would be laid in this area. Which of the following expressions could be used to determine the area of the park that was laid with bricks?



- A.  $(100^2\pi - 200^2)$  square feet
- B.  $(200^2 - 100^2\pi)$  square feet
- C.  $(50^2\pi - 100^2)$  square feet
- D.  $(100^2 - 50^2\pi)$  square feet

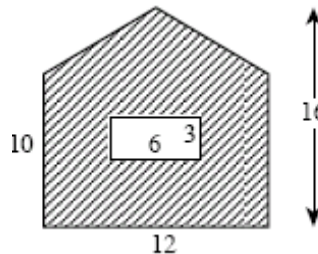
### Gridded Response:

Find the area of the shaded region.



### Short/Extended Response:

Kevin has decided to paint the side of his house, but he's not sure how much paint he needs. In the diagram to the right, the unshaded region represents the window on the side of the house, which is not to be painted.



*Part A:* Explain to Kevin a method he could use to find the area of the side of his house.

*Part B:* Find the area (the dimensions in the diagram are in feet)

*Part C:* If one can of paint covers  $50 \text{ ft}^2$ , how many cans must Kevin buy?

## Measurement Problems Conversions

### **Multiple Choice:**

Malcolm's lawnmower has a fuel tank with a  $1\frac{1}{2}$ -gallon capacity. He added  $2\frac{3}{4}$  quarts of fuel to completely fill the tank. How many *ounces* of fuel were in the tank before Malcolm added fuel to fill the tank?

- A. 52 ounces
- B. 88 ounces
- C. 104 ounces
- D. 192 ounces

### **Gridded Response:**

The Franklin family's house is on a  $2\frac{1}{2}$ -acre plot of land. They use  $\frac{1}{10}$  of the land for a vegetable garden. How many square feet are in the Franklin's vegetable garden?

### **Short/Extended Response:**

Doug is visiting Fira, the capital of the Greek island Santorini. There are 566 steps in the stairway leading from the Aegean Sea to the city. Each step is 0.46 meter high. Doug has already climbed  $\frac{2}{5}$  of the steps to the city. To the nearest thousandth of a kilometer, how many kilometers does Doug have left to climb?

## Measurement Problems Rate, Time, and Distance

### **Multiple Choice:**

A truck left Charlotte, North Carolina, at 5:00 A.M. on day 1 to deliver cargo in the Florida cities of Jacksonville, Miami, and Key West. The driver stopped for breaks a total of 12 hours. His deliveries took an additional 4 hours. He completed his deliveries in Key West at 3:00 P.M. on day 2. If the driver averaged 55 miles per hour while driving, how many miles did the truck travel during the trip?

- A. 550 miles
- B. 990 miles
- C. 1,210 miles
- D. 1,870 miles

### **Gridded Response:**

How many hours longer will it take a car averaging 55 miles per hour than a car averaging 70 miles per hour to travel a distance of 770 miles?

### **Short/Extended Response:**

Shayla rode her bicycle to the bicycle repair shop and then walked home. It took her 10 minutes traveling at 9 miles per hour to get to the shop and 30 minutes to walk home. How fast was she walking?

*Part A:* Write an equation to solve the problem

*Part B:* Solve the problem and show/explain your steps

# **Geometry and Spatial Sense Topics**

**Angle Relationships**

**Coordinate Geometry**

**Proof**

**Properties of Polygons**

**Similar Figures**

**Transformations**

# Geometry and Spatial Sense Problems

## Angle Relationships

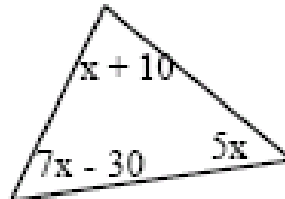
### Multiple Choice:

Triangle ABC is equilateral. If the length of a side is 10 centimeters, what is the length of an altitude?

- A. 5 cm                      C. 10 cm  
B.  $5\sqrt{3}$  cm              D.  $10\sqrt{3}$  cm

### Gridded Response:

Solve for x in the figure to the right.



### Short/Extended Response:

The figure to the right is a rhombus. Give an example of each of the following types of angles:

*Adjacent Angles*

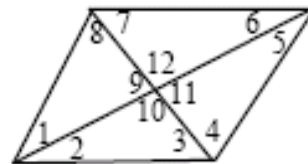
*Vertical Angles*

*Complementary Angles*

*Alternate Interior Angles*

*Right Angle*

*Acute Angle*

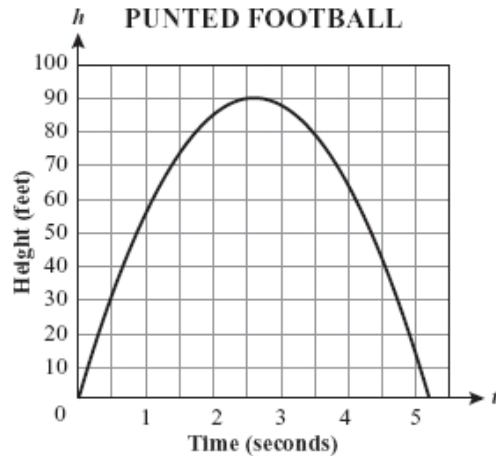


# Geometry and Spatial Sense Problems

## Coordinate Geometry

**Multiple Choice:**

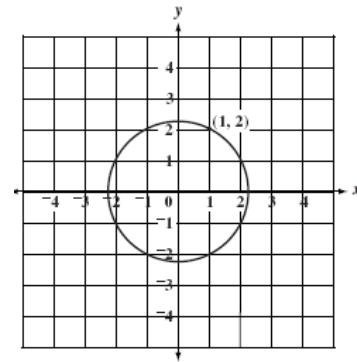
The graph on the coordinate grid to the right represents the height of a football kicked by a football team's punter and the number of seconds the football is in the air. The stands at the football field are 50 feet in height. Based on the graph, when is the football at a height greater than the stands?



- A. at no time throughout the football's path
- B. from about 0.8 seconds until about 4.2 seconds
- C. from about 4.3 seconds until the ball hits the ground
- D. from the time the football is kicked until about 0.7 seconds

**Gridded Response:**

The circle shown is centered at the origin and contains the point (1, 2). To the nearest hundredth, what is the length of the radius of the circle?



**Short/Extended Response:**

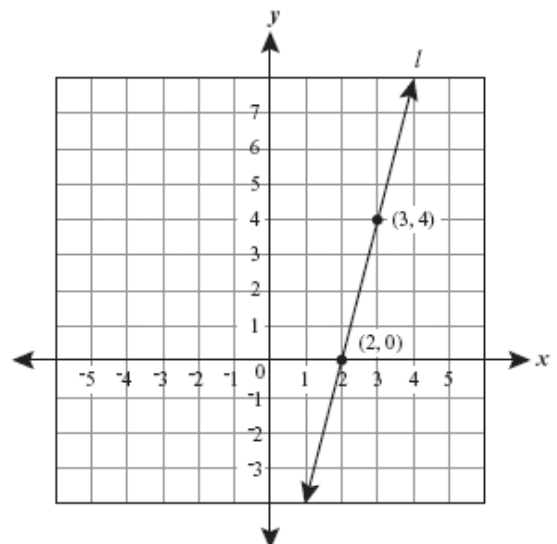
The graph of line  $l$  is shown to the right.

*Part A:* Find the equation of a line parallel to line  $l$ .

*Part B:* Find the equation of a line perpendicular to line  $l$ .

*Part C:* Find the distance between the two points labeled on the graph

*Part D:* Find the midpoint of the two points labeled on the graph



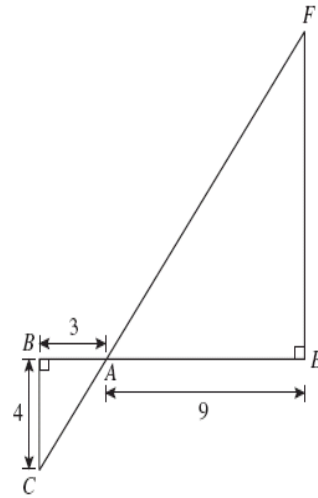
# Geometry and Spatial Sense Problems

## Proof

### Multiple Choice:

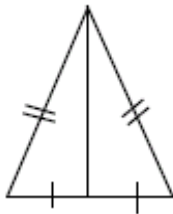
In the diagram to the right,  $\overline{BE}$  and  $\overline{CF}$  intersect at point A. Based on the information in the diagram, which of the following proves that  $\triangle ABC$  is similar to  $\triangle AEF$ ?

- A. Corresponding angles are congruent.
- B.  $\triangle ABC$  and  $\triangle AEF$  are right triangles
- C. The length of  $\overline{AE}$  is 3 times the length of  $\overline{AB}$
- D. The length of  $\overline{BC}$  is proportional to the length of  $\overline{EF}$ .

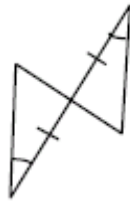


### Gridded Response:

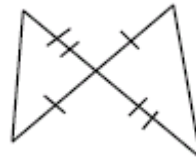
Based on the markings present in the diagrams below, which pair of triangles could be proven congruent by ASA?



1



2



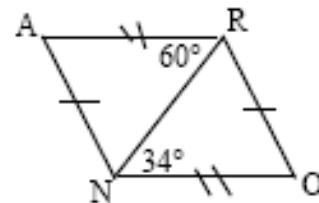
3



4

### Short/Extended Response:

Explain completely why the information being provided in the diagram to the right cannot be correct. Be as precise in your explanation as possible and use appropriate terminology where applicable.

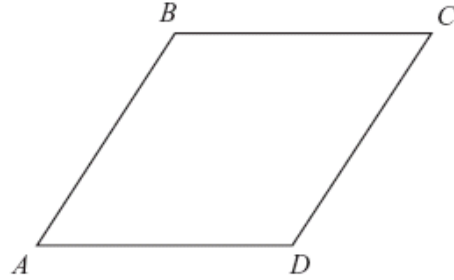


## Geometry and Spatial Sense Problems

### Properties of Polygons

**Multiple Choice:**

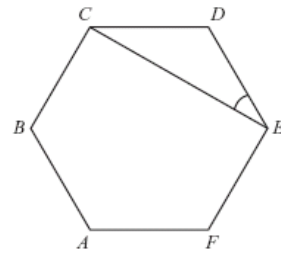
Figure ABCD is a rhombus. The length of line segment AB measures  $(x + 5)$ , and the length of line segment BC measures  $(2x)$ . Which statement explains why the equation  $2x = x + 5$  can be used to solve for  $x$  ?



- A. A square is a type of rhombus.
- B. All sides in a rhombus are congruent.
- C. Opposite sides in a rhombus are parallel.
- D. Opposite angles in a rhombus are congruent.

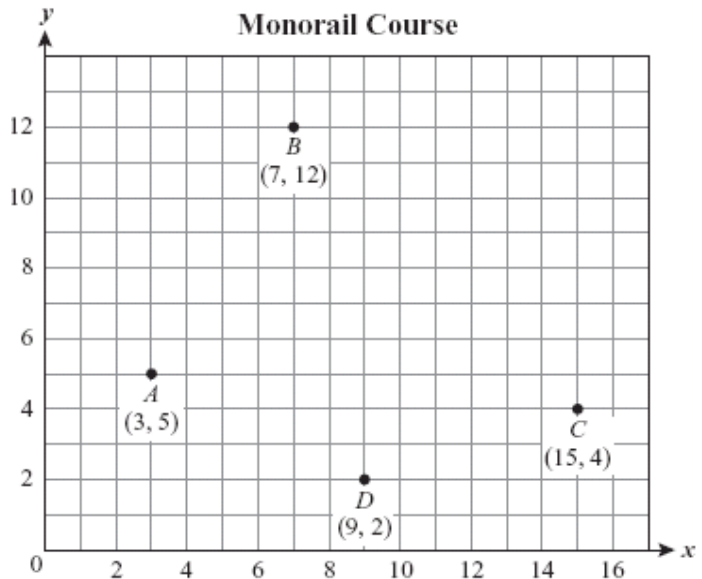
**Gridded Response:**

Figure ABCDEF to the right is a regular hexagon. What is the measure, in degrees, of  $\angle DEC$  ?



**Short/Extended Response:**

The course of the monorail at an amusement park must be changed to make room for a new parking lot. Engineers have decided that only the main supporting column located at point C on the grid to the right should be relocated. They have also decided that the rebuilt course should be in the shape of a parallelogram.



*Part A:* Find the coordinates of C'

*Part B:* Use the definition or properties of a parallelogram to verify that the new monorail course is a parallelogram. You must use the slopes of the sides, the lengths of the sides, or both, to help verify your answer.

## Geometry and Spatial Sense Problems

### Similar Figures

#### **Multiple Choice:**

Two rectangular boxes are geometrically similar. The height of the larger box is 4 times the height of the smaller box. If the volume of the smaller box is 8 cubic centimeters, what is the volume of the larger box?

- A.  $8 \text{ cm}^3$                       C.  $108 \text{ cm}^3$   
B.  $64 \text{ cm}^3$                       D.  $512 \text{ cm}^3$

#### **Gridded Response:**

Gutzon Borglum, the sculptor of Mount Rushmore, created a scale model of the four presidents' faces that were to be carved into the mountain. He used a scale of 1 inch to 12 feet. (That is, 1 inch on the model equaled 12 feet on the mountain.) If the presidents' noses are each 20 feet long on Mount Rushmore, how long is each nose on the scale model?

#### **Short/Extended Response:**

According to a city ordinance, no sign can be erected that is more than 22 feet high. Hamburger Station has just put up a new sign, and the city manager has come to inspect it. To measure the height of the sign, the manager, who is 6 feet tall, stands near the sign pole. He measures the shadow of the pole on the ground and then measures his own shadow. Based on this information, complete the following:

*Part A:* Draw and label a sketch or diagram to illustrate the situation

*Part B:* Using geometric concepts, explain why these two triangles are similar

*Part C:* Set up a proportion that can be used to find the height of the sign

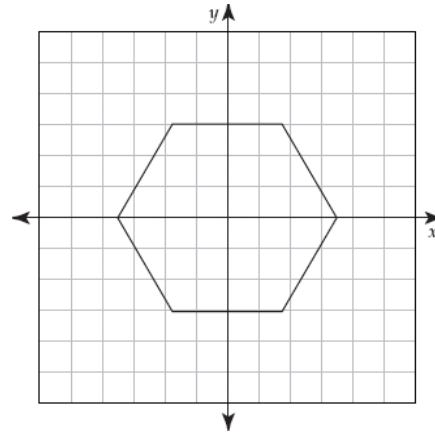
*Part D:* Solve the proportion to find the height of the sign. Can the sign stay, or will it have to be taken down?

# Geometry and Spatial Sense Problems

## Transformations

**Multiple Choice:**

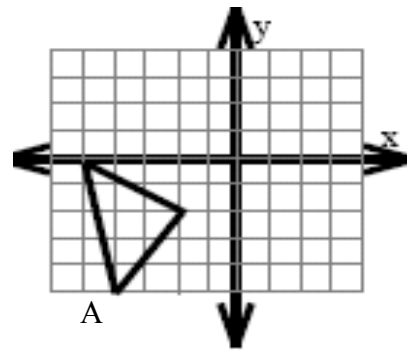
The figure to the right is a regular hexagon. Which of the following transformations of the hexagon above will change the appearance of the hexagon on the grid?



- A. reflection across the x-axis
- B. reflection across the y-axis
- C. rotation of  $60^\circ$  counterclockwise
- D. rotation of  $90^\circ$  clockwise

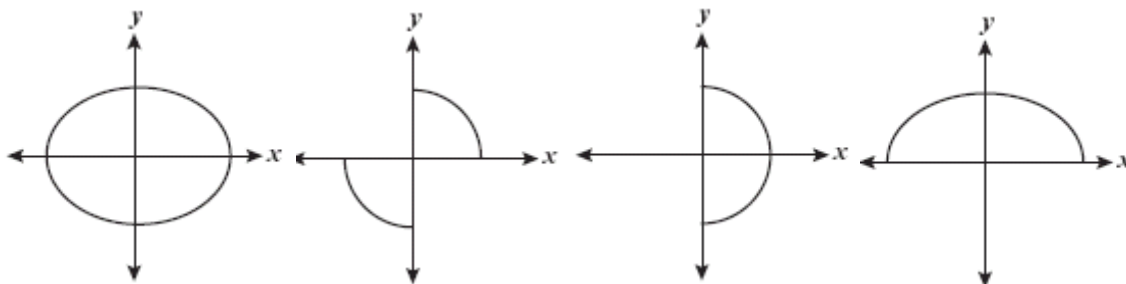
**Gridded Response:**

If the triangle shown on the graph to the right was translated under  $(x, y) \rightarrow (-x, 3y)$ , what would be the x-coordinate of point A'?



**Short/Extended Response:**

For each of the figures pictured below, identify the types of symmetry present and provide support for your answers.



# **Algebraic Thinking Topics**

**Changing Parameters**

**Functions**

**Inequalities**

**Linear Systems**

**Pattern Recognition**

**Converting Words to Alg. Expressions**

## Algebraic Thinking Changing Parameters

### Multiple Choice:

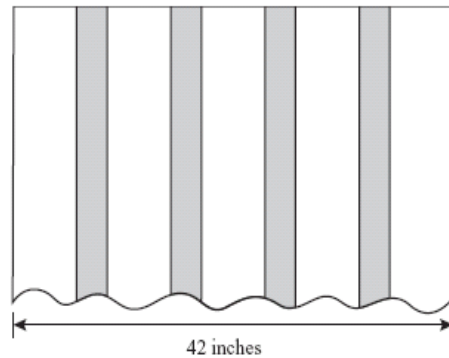
A cosmetic company currently sells its face soap in cylindrical jars that have a height of 2 inches (in.) and a radius of 1.5 inches. The company wants to enlarge its jars to put more face soap in each jar. They want the new jar to have exactly twice the volume of the current jar. Which change in dimensions will achieve this goal?



- A. double the radius                      C. double the diameter  
B. double the height                      D. double the radius and the height

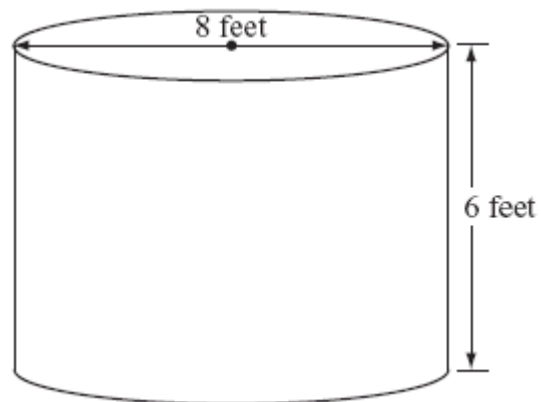
### Gridded Response:

A fabric store sells 42-inch-wide striped fabric with green stripes 3 inches wide and white stripes 6 inches wide. The fabric starts and ends with white stripes and has 4 green stripes, as shown to the right. The store sells a second fabric with 4 green stripes that are each 4 inches wide. Like the pattern above, the green stripes alternate with white stripes, and the fabric starts and ends with white stripes. All of the white stripes on the second fabric are equal to each other in width, and this fabric is the same total width as the fabric in the diagram. What is the width, in inches, of 1 of the white stripes in the second fabric?



### Short/Extended Response:

The Avilas' water-storage tank is shown below. It is in the shape of a right circular cylinder with a diameter of 8 feet and a height of 6 feet. The family wants a new storage tank with a larger capacity. They may increase either the diameter by 1 foot or the height by 1 foot. What is the difference, in cubic feet, in the capacity obtained by increasing the diameter 1 foot and the capacity obtained by increasing the height 1 foot? Show your computations of the two new capacities or give a complete explanation with numerical support to justify your answer.



# Algebraic Thinking Problems

## Functions

### Multiple Choice:

Which of the following relations is a function?

- A. (3,2), (5, 2), (7, 2), (8, 2)
- B. (2, 3), (2, 5), (2, 7), (2, 9)
- C. (1, 2), (2, 5), (2, 1), (5, 1)
- D. (5, 1), (5, 2), (2, 5), (1, 5)

### Gridded Response:

The table below represents the function  $y = 7 - 2x$ . What does  $y$  equal when  $x = -3$ ?

x	10	5	1	-3	-8
y	-13	-3	5	?	23

### Short/Extended Response:

Complete the following for the given table of values:

x	0	3	7	8	11	20	25
y	4	16	32	36	?	84	104

*Part A:* Write a rule in function notation that represents the values in the table

*Part B:* Use the rule to find the missing value in the table

# Algebraic Thinking Problems

## Inequalities

### **Multiple Choice:**

Find the solution to the inequality  $9 - 2x > 15$ .

- A.  $x > -3$                       C.  $x < -3$   
B.  $x > 3$                          D.  $x < 3$

### **Gridded Response:**

At Mathematics Field Day, the mathematics club plans to give each participant a math pin. The company that manufactures the pins charges \$1.10 per pin and a one-time design fee of \$45. Because the club is sponsored by the school, no tax will be added. If the club spends no more than \$150 on the pins, what is the greatest number of math pins the club can order?

### **Short/Extended Response:**

A farmer wants to raise chickens and turkeys. He can have no more than a total of 16 animals and no more than 12 turkeys.

*Part A:* Write the two inequalities that represent the conditions described above.

*Part B:* Graph the appropriate inequalities.

*Part C:* Show the shaded area where the pairs of integer coordinates representing the chickens and turkeys would fit the conditions of this situation.

# Algebraic Thinking Problems

## Linear Systems

### **Multiple Choice:**

In her purse, Tasha has 13 coins that total \$1.60. The coins are quarters and dimes. How many dimes does she have?

- A. 1 dime                      C. 6 dimes  
B. 2 dimes                     D. 11 dimes

### **Gridded Response:**

A family with 2 adults and 4 children pays \$38 to enter Patriot Park for the day. Another family with 4 adults and 3 children pays \$51 to enter the park. What is the price for an adult to enter the park?

### **Short/Extended Response:**

Complete the following for the equations  $x - y = 3$  and  $x + y = 7$ :

*Part A:* Find the solution that satisfies both equations

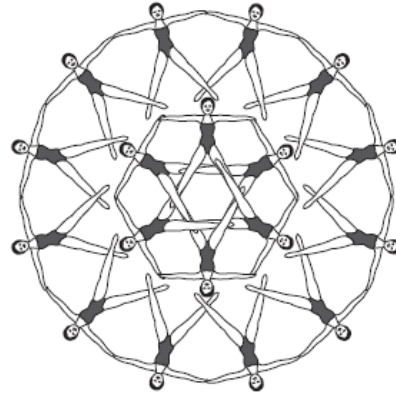
*Part B:* Verify this solution by sketching a graph of the two equations

*Part C:* Give the coordinates of a point that satisfies  $x - y = 3$  but NOT  $x + y = 7$ .

## Algebraic Thinking Problems Pattern Recognition

### Multiple Choice:

Alexi is planning the finale of a synchronized swimming show. The figure to the right represents a pattern he wants to create. The pattern has an innermost ring of 6 swimmers. Each additional ring will need 2 swimmers for each swimmer in the previous ring. If the finale consists of 4 rings formed according to this pattern, what will be the *total* number of swimmers needed to form all 4 rings?



- A. 36            C. 90  
B. 48            D. 96

### Gridded Response:

What is the common ratio in this geometric sequence?

0.7, 3.5, 17.5, 87.5, ...

### Short/Extended Response:

Robert is stacking logs for his father. The log pile is in the shape of a trapezoid with 20 logs in the bottom row and 5 logs in the top row. Each row has one less log than the row below it.

*Part A:* Write an expression to determine the number of logs in any row of the pile.

*Part B:* Determine the total number of rows in the pile.

*Part C:* Determine the total number of logs in the pile.

## Algebraic Thinking

### Converting Words to Algebraic Expressions

#### **Multiple Choice:**

Which algebraic expression means the number of days in 3 less days than  $y$  weeks?

- A.  $7(y - 3)$                       C.  $7y - 3$   
B.  $3 - 7y$                          D.  $7(3 - y)$

#### **Gridded Response:**

In the last basketball game, sisters Sari and Sandi scored a total of 42 points. Sari scored 3 less than 2 times the number of points Sandi scored. How many points did Sandi score?

#### **Short/Extended Response:**

The sum of the length and width of a rectangle is 44 inches. The length is 3 times the width. Find the dimensions of the rectangle. Show/explain all steps that lead to your answer.

# **Data Analysis and Probability Topics**

**Central Tendency**

**Event Probabilities**

**Various Graph Types**

**Scatter Plots**

**Miscellaneous**

# Data Analysis and Probability Problems

## Central Tendency

### **Multiple Choice:**

The number of portable buildings produced by Chambers Manufacturing last week was 70 on Monday, 60 on Tuesday, 80 on Wednesday, and 50 on Thursday. After production on Friday, the mean number of buildings produced for the week was 67. What is the median number of buildings produced last week by Chambers Manufacturing?

- A. 67            C. 70  
B. 68            D. 75

### **Gridded Response:**

Ed has worked six weeks at Jimbo's Pizzeria. For the first 5 weeks that Ed worked, his mean pay was \$120.00. He earned \$180.00 during his 6th week. What was his mean pay for all 6 weeks?

### **Short/Extended Response:**

The office manager in a small office was asked to reduce fax machine usage. To keep track of the usage, the employees used a log to record the number of faxes sent each day. The data recorded during a 14-day period are shown below.

9, 8, 10, 6, 9, 1, 0, 8, 7, 5, 9, 10, 2, 0

*Part A:* Find the mean of the data

*Part B:* Find the median of the data

*Part C:* Find the mode of the data

*Part D:* Find the range of the data

## Data Analysis and Probability Problems

### Event Probabilities and Counting Procedures

#### **Multiple Choice:**

A friend gave Tina 2 boxes of flower seedlings to plant in the garden. One box contains 5 geraniums and 3 marigolds. The other box contains 4 geraniums, 4 marigolds, and 2 pansies. If Tina chooses 1 seedling from each box at random, what is the probability they will both be marigolds?

- A.  $\frac{4}{9}$       B.  $\frac{7}{11}$       C.  $\frac{3}{20}$       D.  $\frac{7}{18}$

#### **Gridded Response:**

At an ice cream stand, 6 different flavors of ice cream are available: vanilla, chocolate, strawberry, peach, mint, and banana. A customer wants to order a double-dip ice cream cone with 2 different flavors. Using the 6 flavors listed, what is the total number of different combinations possible for a double-dip cone with 2 different flavors??

#### **Short/Extended Response:**

Students at Sawgrass High School will begin wearing uniforms in P. E. classes in the fall. Each student will have 3 different-colored shirts, black, red, and white, and 3 different-colored pairs of shorts, black, red, and white.

*Part A:* Construct a tree diagram to represent this situation.

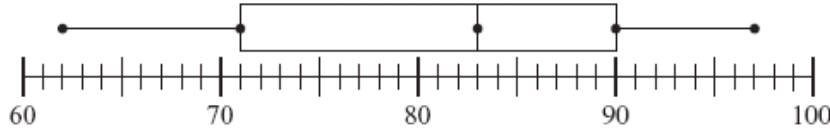
*Part B:* If a student's uniform consists of 1 shirt and 1 pair of shorts, what is the total number of different uniforms the student can wear?

## Data Analysis and Probability Problems

### Data From Various Graph Types

**Multiple Choice:**

The box-and-whisker plot below shows the daily high temperature in Jacksonville over a 6 month period.



Which of the following is a correct interpretation of the box-and-whisker plot?

- A. The median high temperature was  $80.5^{\circ}$ .
- B. The range of temperatures was  $18^{\circ}$ .
- C. The lowest temperature recorded was  $60^{\circ}$ .
- D. The highest temperature recorded was  $97^{\circ}$ .

**Gridded Response:**

The stem-and-leaf plot to the right shows the hourly wages of a group of 25 workers. The workers are performing similar tasks but, because of differences in length of work experience and skill, are paid at different rates. What percent of the workers are paid less than \$18 per hour?

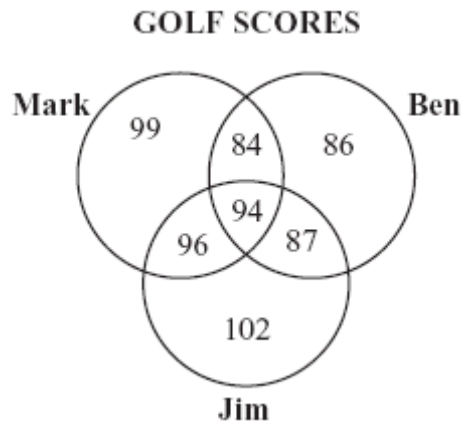
**WORKERS' HOURLY WAGES**

Stem	Leaf
16	7 8 8 8 9
17	5 6 6 7 7 8 8 9 9
18	0 0 0 1 1 5
19	0 0 2 3 3

KEY	
17	5 = \$17.50

**Short/Extended Response:**

Jim, Ben, and Mark played in a four-day golf tournament. The four scores for each golfer are shown in the Venn diagram to the right.



*Part A:* What is the lowest score that Mark and Jim have in common?

*Part B:* What was the score that all three golfers had in common?

*Part C:* In golf, the winner is the person with the lowest score. Who won the tournament? Show/explain the work necessary to find your answer.

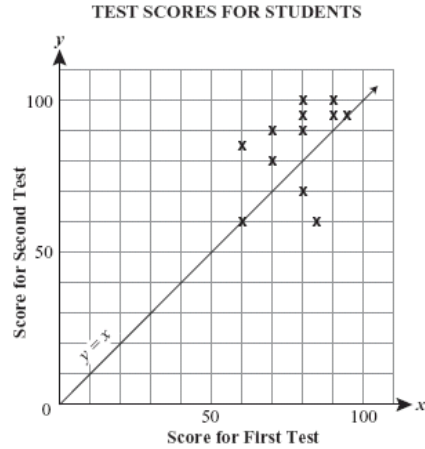
# Data Analysis and Probability

## Scatter Plots

### Multiple Choice:

The graph to the right shows the test scores for two tests taken by students in an Algebra I class. Which of the following is the correct mean score of the first test?

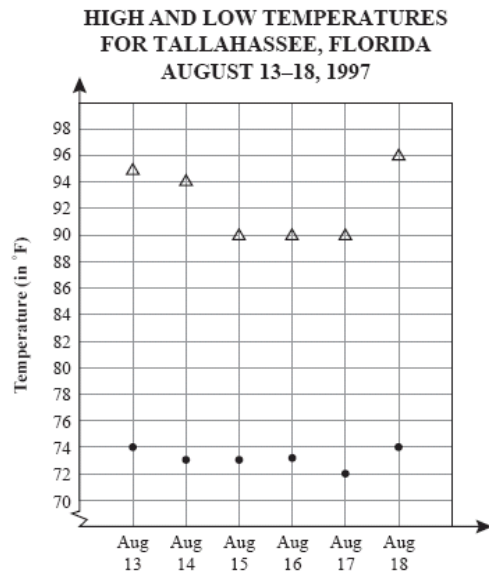
- A. 70                      C. 81.2  
 B. 78.3                    D. 83



### Gridded Response:

The scatter plot to the right shows high and low temperature information for Tallahassee, Florida, for six consecutive days in August 1997.

KEY	
△	High Temperature
●	Low Temperature



### Short/Extended Response:

Construct a scatter plot for the following information and explain whether there is positive, negative, or no correlation to the data.

Student	Homework (Minutes)	Television (Minutes)
1	30	60
2	90	90
3	90	0
4	75	120
5	60	150
6	75	90
7	45	60
8	60	0
9	0	210
10	45	30

# Data Analysis and Probability Problems

## Miscellaneous

### Multiple Choice:

Four students ran for student government president at Central High School. The results of the election are listed by class below. Based on the information in the table, which of the following statements can be verified?

CENTRAL HIGH SCHOOL ELECTION RESULTS

Class	Presidential Candidates				Total Number of Votes by Class
	Joe	Alexa	Karen	Sergio	
Freshmen	146	210	100	160	616
Sophomores	60	100	110	60	330
Juniors	80	163	110	65	418
Seniors	190	222	206	218	836
<b>Total By Candidate</b>	476	695	526	503	

- A. Only one candidate received more than one-fourth of the votes.
- B. Alexa received the most senior votes because she is a senior this year.
- C. Karen received more sophomore votes than Sergio and Joe combined.
- D. Fewer freshmen than seniors voted because fewer freshmen were enrolled.

### Gridded Response:

If you choose two letters at random from the letters in the word GRADUATION, what is the probability that both letters selected will be consonants? Grid your answer in fraction form.

### Short/Extended Response:

A company that makes computer CDs has manufacturing plants in three cities. The plant in Boca Raton makes 60 percent of the CDs. The plants in Deland and Fort Myers each make 20 percent of the CDs.

An inspector checking for quality finds that over several months, each plant produces about 350 defective CDs per week. The inspector concludes that all three plants are producing work at the same standard of quality.

*Should we agree with the inspector's conclusion? Explain your answer.*