

DC Office of the State Superintendent of Education

District of Columbia

Comprehensive Assessment System

2009 Released Items

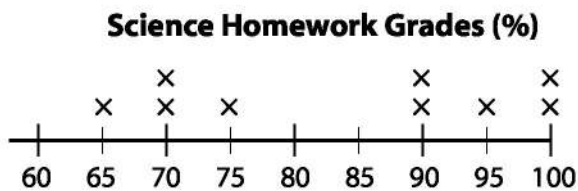
Tenth Grade Mathematics



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The line plot below shows the grades Krystal got on nine homework assignments in Science.



To the nearest percent, what is Krystal's mean homework score?

- F** 80%
- G** 84%
- H** 90%
- J** 94%

Content: Mathematics
Item Number: 2
Item ID: 01011291
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

A skateboard manufacturer reported the sales for 8 weeks during the spring season, as shown below.

Skateboard Sales

Week	Number of Skateboards Sold
1	4,500
2	5,200
3	5,000
4	6,500
5	5,500
6	6,200
7	7,100
8	4,900

With one week left in the spring season, the manufacturer's goal is to raise the weekly median number of sales to 5,400 for the season. Which of these shows the number of skateboards the manufacturer must sell in the final week to meet this goal?

- A** 3,700
- B** 5,400
- C** 5,600
- D** 7,200

Content: Mathematics
Item Number: 7
Item ID: 00882617
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability



Office of the State Superintendent of Education



DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Leon surveyed some friends about the average time, in minutes, it takes them to get to work and the distance, in miles, that they travel. His results are shown in the scatter plot below.



Identify the best equation to represent Leon's data for the scatter plot above.

F $y = \frac{2}{5}x$

G $y = \frac{1}{2}x$

H $y = 2x$

J $y = 5x$

Content: Mathematics
Item Number: 8
Item ID: 01011235
Item Type: Multiple Choice

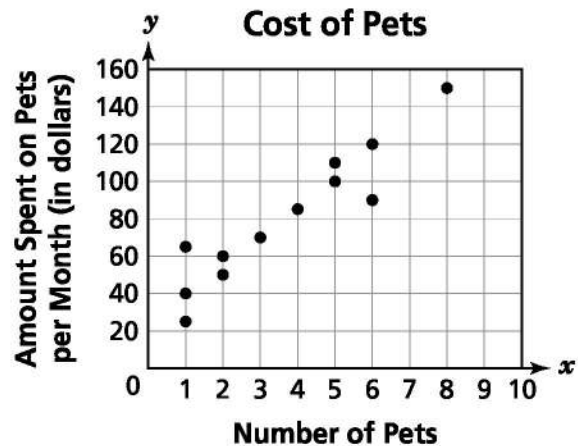
Answer Key: H
Max. score points: 1
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Erin conducted a survey about the number of pets people have and the amount of money people spend on their pets per month. Her results are shown in the scatter plot below.



Identify the best equation to represent data for the scatter plot above.

- F** $y = -15x + 30$
- G** $y = -x + 3$
- H** $y = x + 3$
- J** $y = 15x + 30$

Content: Mathematics
Item Number: 12
Item ID: 01011229
Item Type: Multiple Choice

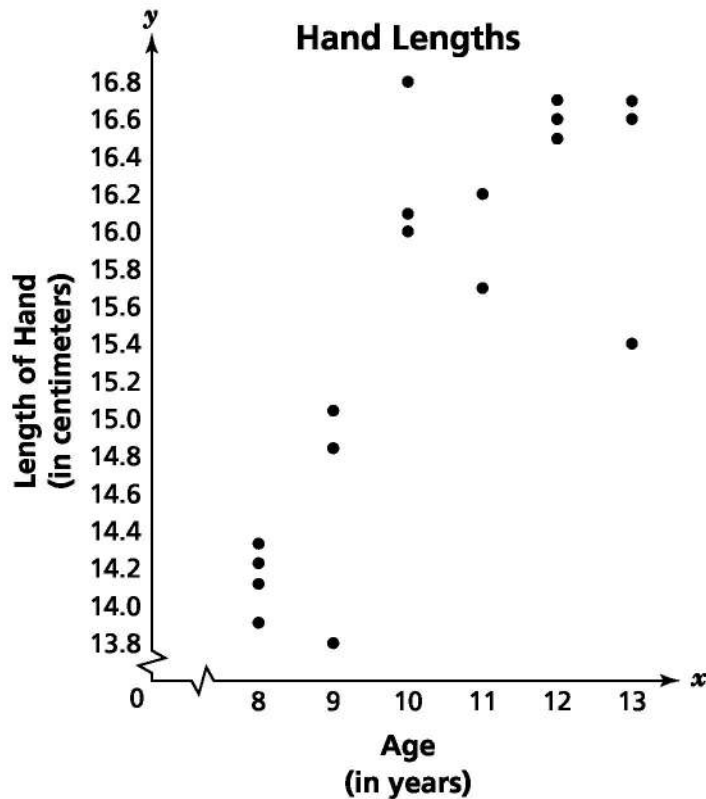
Answer Key: J
Max. score points: 1
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The scatter plot below shows the lengths, in centimeters, of the hands of children by age?



According to the data given in the scatter plot, how old is the child with the longest hand?

- A** 8
- B** 9
- C** 10
- D** 13

Content: Mathematics
Item Number: 15
Item ID: 01173421
Item Type: Multiple Choice

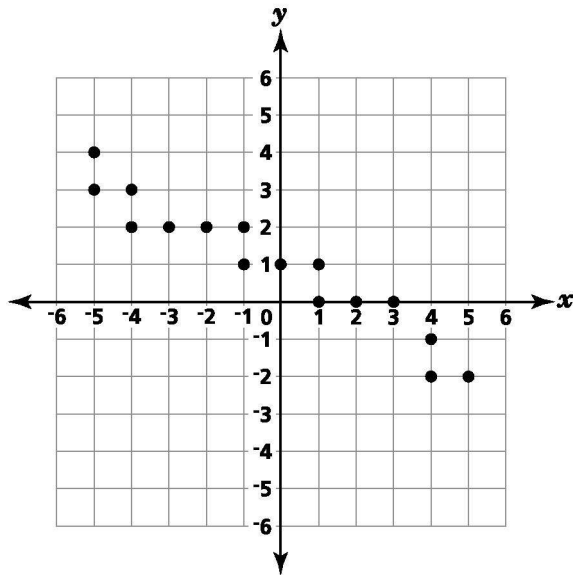
Answer Key: C
Max. score points: 1
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Look at the scatter plot below.



Identify the best equation to represent data for the scatter plot above.

- A** $y = -2x + 1$
- B** $y = -\frac{1}{2}x + 1$
- C** $y = \frac{1}{2}x + 1$
- D** $y = 2x + 1$

Content: Mathematics
Item Number: 27
Item ID: 01011227
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability



Office of the State Superintendent of Education



DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Stacey asked 10 girls from her 10th grade English class which type of TV show is their favorite. The results of her survey are shown in the table below.

Favorite Type of TV Show

Type of TV Show	Number of Students
Comedy	5
Drama	2
News	1
Reality	2

After studying the data in the table, Stacey concluded that the favorite type of TV show for most of the students in her high school is comedy. On the lines in the answer booklet, give three reasons why Stacey's conclusion is invalid.

Reason 1 _____

Reason 2 _____

Reason 3 _____

Content: Mathematics
Item Number: 29
Item ID: 00882595
Item Type: Constructed Response

Answer Key:
Max. score points: 3
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability

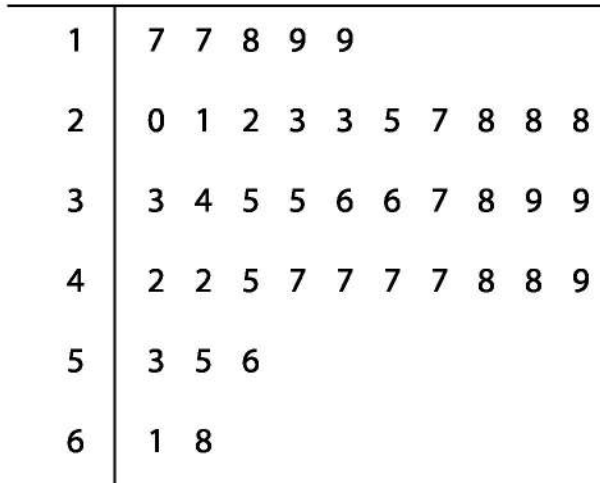


Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The stem-and-leaf plot below shows the ages of 40 people who won tickets to a concert.

Ages of Concert Ticket Winners



KEY
1 8 = 18 years

What is the mode of the data?

- F** 28
- G** 36
- H** 47
- J** 49

Content: Mathematics
Item Number: 30
Item ID: 01011277
Item Type: Multiple Choice

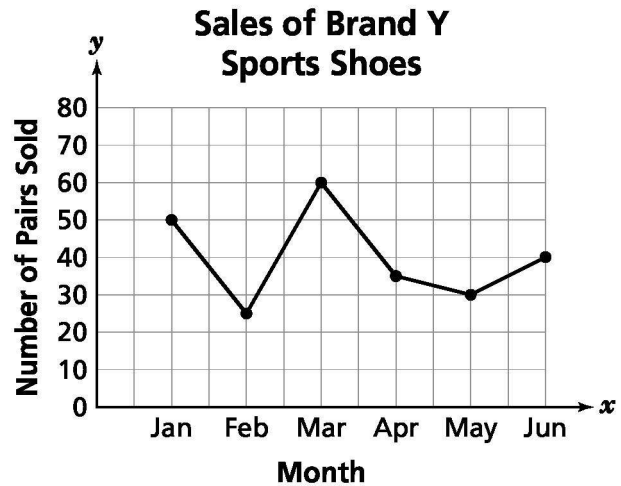
Answer Key: H
Max. score points: 1
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The line graphs below show the sales of two different brands of sports shoes at a store during different months.



What is the difference in the mean sales of both brands?

- A** 10
- B** 20
- C** 25
- D** 60

Content: Mathematics
Item Number: 41
Item ID: 01173303
Item Type: Multiple Choice

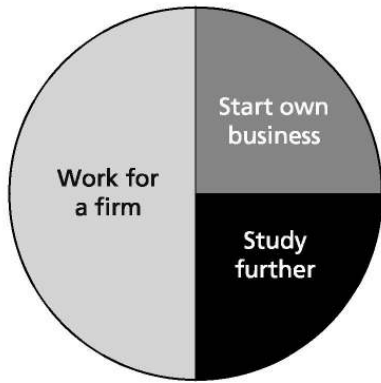
Answer Key: A
Max. score points: 1
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability



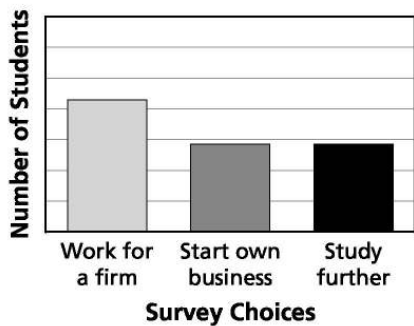
Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

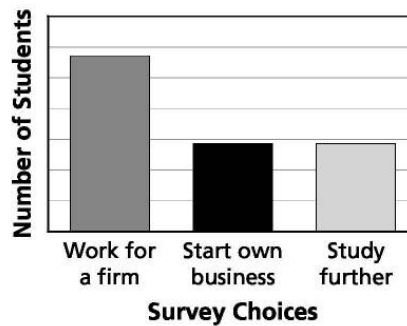
Students from a business school were surveyed to find if they prefer to work for a firm, start their own business, or study further after graduation. The pie chart below shows the results of the survey.



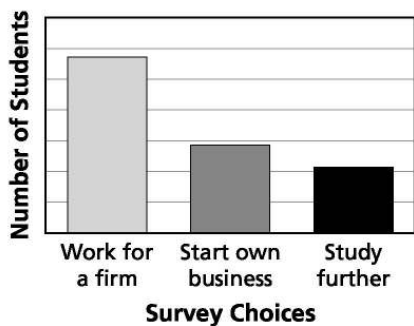
Which of these bar graphs best represents the results of the survey?



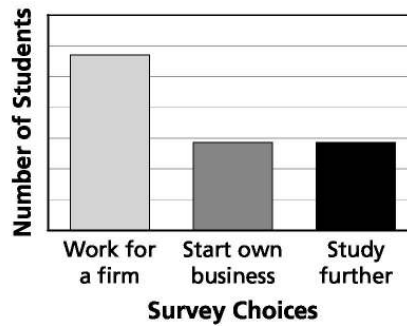
A



C



B



D

Content: Mathematics
 Item Number: 51
 Item ID: 01173309
 Item Type: Multiple Choice

Answer Key: D
 Max. score points: 1
 Standard: AI.D.1
 Reporting Category: Data Analysis, Statistics & Probability

Pieces of paper numbered 1 through 10 are placed in a hat and drawn out one at a time without being replaced. The number 3 is drawn first. Then the number 1 is drawn. What is the probability that the next number drawn will be divisible by 3?

F $\frac{1}{4}$

G $\frac{3}{10}$

H $\frac{1}{5}$

J $\frac{3}{7}$

Content: Mathematics
Item Number: 54
Item ID: 00539827
Item Type: Multiple Choice

Answer Key: F
Max. score points: 1
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The number of students that used public transportation during one week is shown in the table below.

Public Transportation

Monday	Tuesday	Wednesday	Thursday	Friday
59	59	62	60	67

What is the median of the data?

- A** 59
- B** 60
- C** 61
- D** 62

Content: Mathematics
Item Number: 57
Item ID: 01011299
Item Type: Multiple Choice

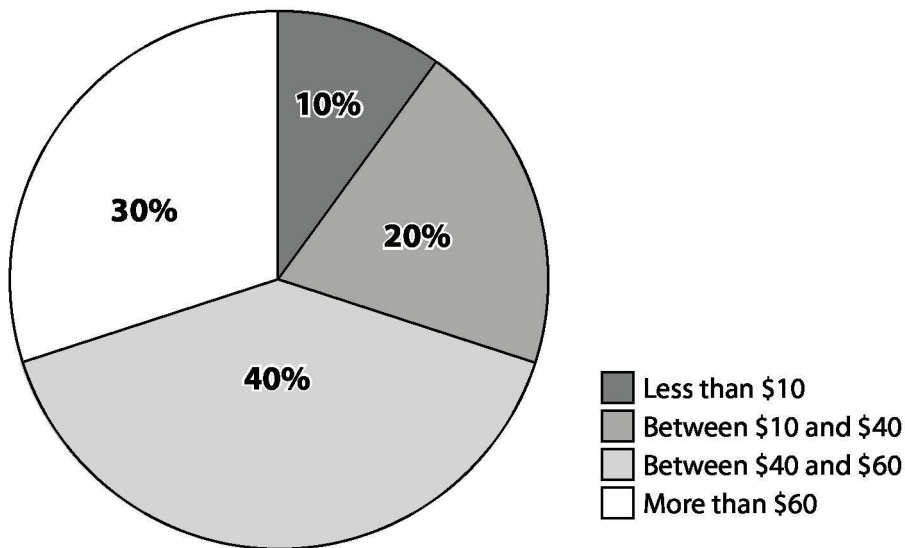
Answer Key: B
Max. score points: 1
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Dalia made the circle graph below to show the prices of the 30 top-selling games in a video shop.



Which table best represents this circle graph?

A

Price	Number of Games
Less than \$10	3
Between \$10 and \$40	6
Between \$40 and \$60	12
More than \$60	9

C

Price	Number of Games
Less than \$10	3
Between \$10 and \$40	6
Between \$40 and \$60	9
More than \$60	12

B

Price	Number of Games
Less than \$10	3
Between \$10 and \$40	8
Between \$40 and \$60	15
More than \$60	4

D

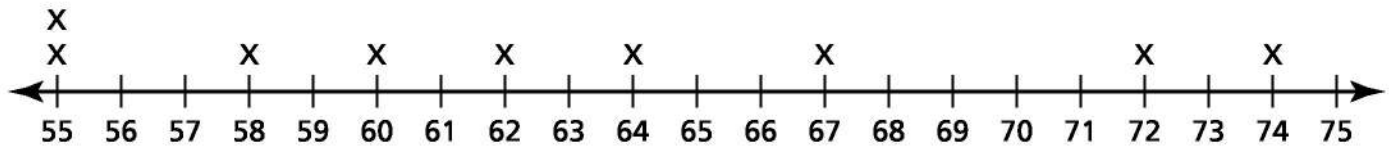
Price	Number of Games
Less than \$10	3
Between \$10 and \$40	4
Between \$40 and \$60	8
More than \$60	15

Content: Mathematics
 Item Number: 65
 Item ID: 01011259
 Item Type: Multiple Choice

Answer Key: A
 Max. score points: 1
 Standard: AI.D.1
 Reporting Category: Data Analysis, Statistics & Probability

The line plot below shows the test scores for the students in Ms. Brown's class. Margaret took the test a day later than the other students. She scored 68 on the test.

Class Test Scores



Which of these statements about the class median test score is true after including Margaret's score?

- F** It increased by 1.
- G** It increased by 2.
- H** It decreased by 1.
- J** It remained the same.

Content: Mathematics
Item Number: 70
Item ID: 01173439
Item Type: Multiple Choice

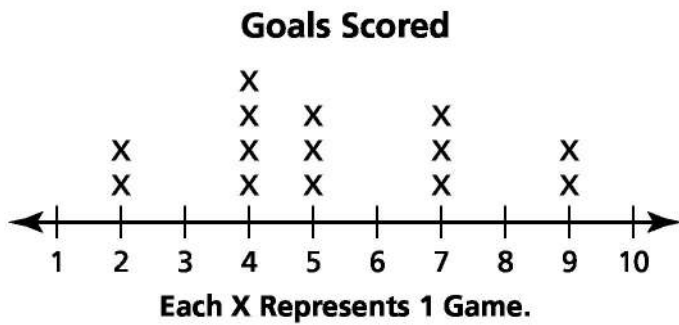
Answer Key: F
Max. score points: 1
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The line plot below shows the number of goals a field hockey team scored in different games.



What is the median number of goals the team scored?

- A** 10
- B** 7
- C** 5
- D** 4

Content: Mathematics
Item Number: 35
Item ID: 01173453
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

DC CAS Release Item

A survey was conducted among 200 high school students to find which of 4 careers they would like to pursue. The table below shows the results of the survey.

High School Student Survey

Career	Number of Students
Law	100
Medicine	50
Engineering	40
Architecture	10

- A The given data is to be represented on a circle graph. Calculate the measure of the angle needed for the Engineering section of the circle graph. Show your work in the box in the answer booklet and write your answer on the line.
- B Using the circle graph in the answer booklet, correctly label each sector and its percentage.

A

Engineering _____ degrees

B

_____ %

_____ %

_____ %

_____ %

Content: Mathematics
Item Number: 43
Item ID: 01173317
Item Type: Constructed Response

Answer Key:
Max. score points: 3
Standard: AI.D.1
Reporting Category: Data Analysis, Statistics & Probability

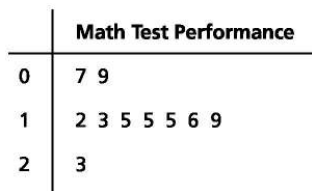


A group of students was surveyed about their performance on a math test.

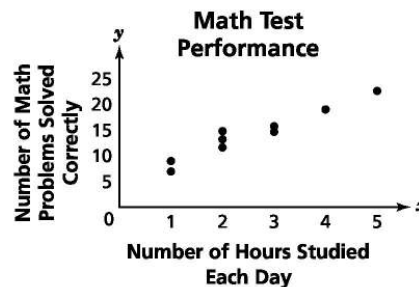
The table below shows the number of hours they studied each day and the number of math problems they solved correctly on the test.

Students	Number of Hours Studied each day	Number of Math Problems Solved Correctly
A	3	16
B	2	12
C	2	13
D	5	23
E	1	9
F	3	15
G	4	19
H	1	7
I	3	15
J	2	15

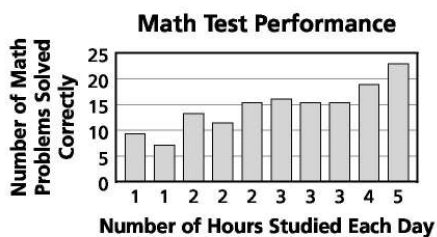
Which of these graphs best represents the relationship between the number of hours studied and the number of problems solved correctly?



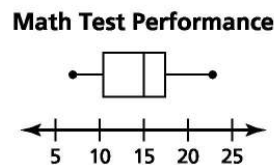
A



C



B



D

Content: Mathematics
 Item Number: 51
 Item ID: 01173319
 Item Type: Multiple Choice

Answer Key: C
 Max. score points: 1
 Standard: AI.D.1
 Reporting Category: Data Analysis, Statistics & Probability



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
 MAYOR ADRIAN M. FENTY

Which of these equations shows the correct use of the associative property of multiplication?

- F** $(106 \times 250) \times 15 = 106 \times (250 \times 15)$
- G** $(106 \times 250) \times 15 \times 1 = (106 \times 250) \times 15$
- H** $(106 \times 250) \times 15 = 15 \times (106 \times 250)$
- J** $(106 \times 250) \times 15 = (106 \times 15) \times (250 \times 15)$

Content: Mathematics
Item Number: 14
Item ID: 01173419
Item Type: Multiple Choice

Answer Key: F
Max. score points: 1
Standard: AI.N.1
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Grace uses mental math to simplify the expression below.

$$4(37 + 12 + 13)$$

She rearranges the calculation to make it simpler. Which expression will give the same result?

- A** $4(37 + 12) + 13$
- B** $4(12 + 13) + 37$
- C** $4(37) + (12 + 13)$
- D** $4(37 + 13) + 4(12)$

Content: Mathematics
Item Number: 17
Item ID: 01011231
Item Type: Multiple Choice

Answer Key: D
Max. score points: 1
Standard: AI.N.1
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

What fraction belongs in the box to make the equation true?

$$-\frac{4}{9} \times \boxed{} = 1$$

A $-\frac{4}{9}$

B $-\frac{9}{4}$

C $\frac{4}{9}$

D $\frac{9}{4}$

Content: Mathematics
Item Number: 19
Item ID: 00882583
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: AI.N.1
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education



DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Corey had 7 rolls of ribbon. Each roll contained 40 feet of ribbon. He also had 1 roll that contained 25 feet of ribbon. Which of these number sentences shows how to find how many feet of ribbon Corey had in all?

- A** $7 \times (40 - 25) = \square$
- B** $7 \times (40 + 25) = \square$
- C** $(7 + 40) + 25 = \square$
- D** $(7 \times 40) + 25 = \square$

Content: Mathematics
Item Number: 61
Item ID: 00539805
Item Type: Multiple Choice

Answer Key: D
Max. score points: 1
Standard: AI.N.1
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Simplify the expression below.

$$2(5^3 - 5^2)$$

- A** 10
- B** 100
- C** 200
- D** 225

Content: Mathematics
Item Number: 31
Item ID: 01011267
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: AI.N.2
Reporting Category: Number Sense & Operations



Look at the expression below.

$$2[4 + (2^3 - 1)]$$

Which of the following expressions is not equivalent?

A $6 + (2^3 + 8)$

B $5^2 - \frac{1+5}{2}$

C $6 \cdot 3 + 5 - 2$

D $6 | 2 - 6 | - 2$

Content: Mathematics
Item Number: 33
Item ID: 01173427
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: AI.N.2
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education



DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The area, in square centimeters, of a complex shape can be found using the expression below.

$$16(31 - 7) - 5^2 + 7^2$$

Which of the following represents the area of the shape?

- A** 310 square centimeters
- B** 388 square centimeters
- C** 408 square centimeters
- D** 513 square centimeters

Content: Mathematics
Item Number: 37
Item ID: 01011245
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: AI.N.2
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

What is the value of the expression below?

$$5|2 - 6| - |-13|$$

F -33

G -7

H 7

J 33

Content: Mathematics
Item Number: 16
Item ID: 01173445
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: AI.N.2
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The area, in square centimeters, of a complex shape can be found using the expression below.

$$16(31 - 7) - 5^2 + 7^2$$

Which of the following represents the area of the shape?

- A** 310 square centimeters
- B** 388 square centimeters
- C** 408 square centimeters
- D** 513 square centimeters

Content: Mathematics
Item Number: 37
Item ID: 01011245
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: AI.N.2
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Mr. Briscoe is a baker. He buys 5.5 pounds of walnuts for \$26.40. How much will it cost him to buy 19 pounds of walnuts at the same price?

A \$7.64

C \$104.50

B \$91.20

D \$501.60

Content: Mathematics
Item Number: 5
Item ID: 01011287
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: AI.N.3
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

In October, a plant was 12 inches tall. Six months later the plant was 48 inches tall. What was the average monthly growth rate of the plant?

- A** 4 inches per month
- B** 6 inches per month
- C** 8 inches per month
- D** 10 inches per month

Content: Mathematics
Item Number: 23
Item ID: 01011239
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: AI.N.3
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Randa drove a total distance of 120 miles to an amusement park. She drove the first 70 miles at an average speed of 45 miles per hour and the remaining distance at an average speed of 55 miles per hour. About how many hours did Randa take to reach the amusement park?

- F** 4.8
- G** 2.7
- H** 2.5
- J** 1.2

Content: Mathematics
Item Number: 42
Item ID: 01173315
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: AI.N.3
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The regular price of a coat is \$125. During a sale, the store offered a 6% discount on the regular price of the coat. Shaun has a coupon for an additional 8% discount off the sale price. If he buys the coat during the sale and uses both discounts, how much money will he save?

- A** \$7.50
- B** \$10.00
- C** \$16.90
- D** \$17.50

Content: Mathematics
Item Number: 69
Item ID: 01173459
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: AI.N.3
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Which of these is equivalent to $(\sqrt{8})^{\frac{2}{3}}$?

F $\sqrt[2]{8}$

G $\sqrt[3]{8}$

H 8^3

J 8^2

Content: Mathematics
Item Number: 20
Item ID: 00882621
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: AI.N.4
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Which of these is the best estimate of the square root of 40?

- F** 5.8
- G** 6.3
- H** 6.8
- J** 7.3

Content: Mathematics
Item Number: 44
Item ID: 01011295
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: AI.N.4
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Which number is a reasonable estimate for the square root of 5,028?

- F** 70
- G** 700
- H** 2,500
- J** 5,000

Content: Mathematics
Item Number: 62
Item ID: 00882635
Item Type: Multiple Choice

Answer Key: F
Max. score points: 1
Standard: AI.N.4
Reporting Category: Number Sense & Operations



Jorge is planning a trip. He made a table of rough estimates of how far he can travel each day.

Day	Distance Traveled (miles)
Wednesday	210
Thursday	80
Friday	170
Saturday	90

Jorge judges that each distance could actually be 10 miles more or less than his estimates. What are the shortest and longest total distances Jorge might drive from Wednesday through Saturday?

- F** 545; 555
- G** 540; 560
- H** 530; 570
- J** 510; 590

Content: Mathematics
Item Number: 64
Item ID: 01011297
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: AI.N.4
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Which of these is the best estimate of the square root of 40?

- F** 5.8
- G** 6.3
- H** 6.8
- J** 7.3

Content: Mathematics
Item Number: 44
Item ID: 01011295
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: AI.N.4
Reporting Category: Number Sense & Operations



Which of these is equivalent to $\left(\frac{27}{125}\right)^{\frac{2}{3}}$?

A $\frac{3}{5}$

B $\frac{3^2}{5^3}$

C $\left(\frac{3}{5}\right)^2$

D $\frac{3^3}{5^2}$

Content: Mathematics
Item Number: 35
Item ID: 01173431
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: AI.N.5
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education



DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Which of these is equivalent to $8^{\frac{2}{3}}$?

A $\sqrt{8^3}$

B $\sqrt[3]{8^2}$

C 8^3

D 8^2

Content: Mathematics
Item Number: 63
Item ID: 00882611
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: AI.N.5
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education



DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Simplify the expression below.

$$\left(10^{\frac{1}{2}}\right)\left(10^{\frac{1}{4}}\right)$$

F 10^2

G $10^{\frac{1}{6}}$

H $10^{\frac{1}{8}}$

J $10^{\frac{3}{4}}$

Content: Mathematics
Item Number: 66
Item ID: 01011261
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: AI.N.5
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education



DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

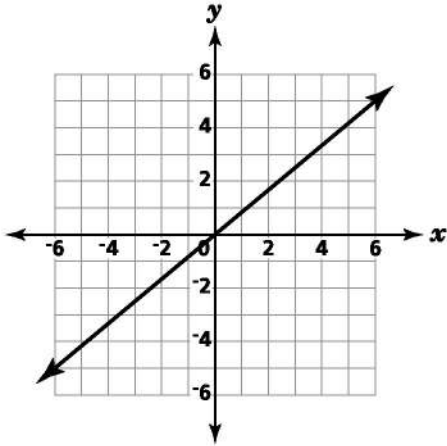
The cost of printing posters at a print shop is \$2 per poster for the first 50 posters and \$1.80 per poster for every additional poster. What would be the cost if the shop printed 60 posters for your school?

- A** \$208
- B** \$120
- C** \$118
- D** \$108

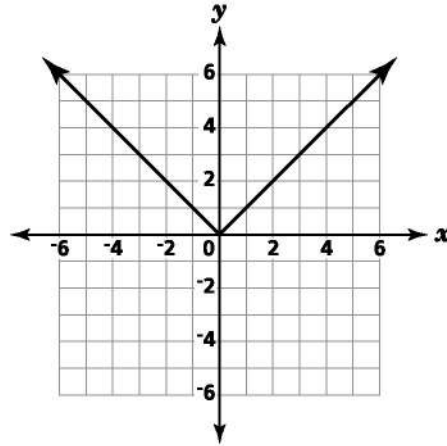
Content: Mathematics
Item Number: 69
Item ID: 01173437
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: AI.P.1
Reporting Category: Patterns, Relations & Algebra

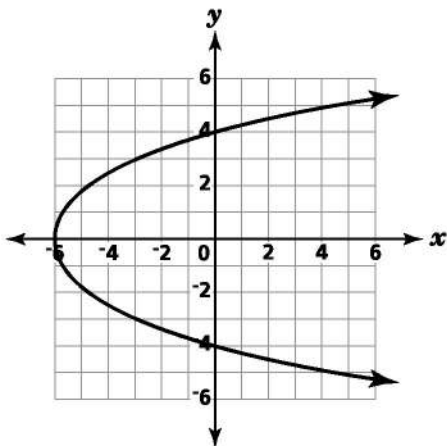
Which of these is not a function?



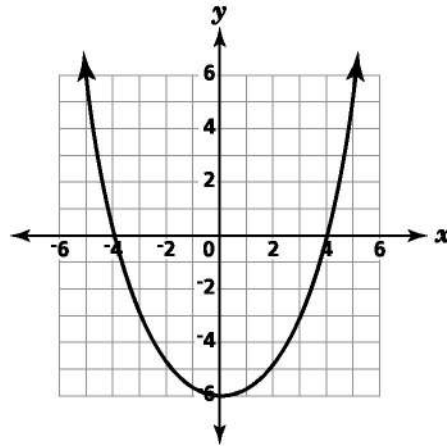
F



H



G



J

Content: Mathematics
 Item Number: 22
 Item ID: 00882579
 Item Type: Multiple Choice

Answer Key: G
 Max. score points: 1
 Standard: A1.P.3
 Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education



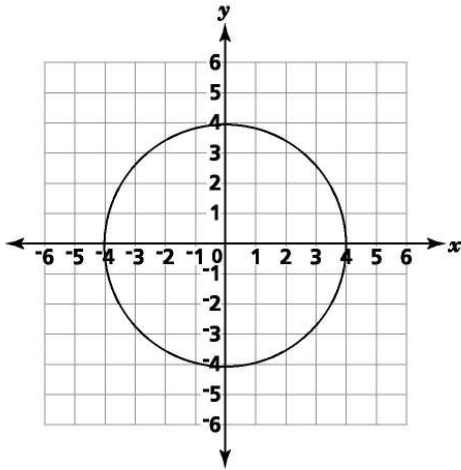
DISTRICT OF COLUMBIA
 MAYOR ADRIAN M. FENTY

DC CAS Release Item

A What are the domain and range of the function below? Show your work in the box in the answer booklet and write your answer on the line.

$$f(x) = x + 3, \text{ where } x \text{ is a counting number and } x \leq 5$$

B Explain why the graph shown below does not represent a function.



Write your answer on the line in the answer booklet.

A

Domain _____

Range _____

B

Content: Mathematics
Item Number: 32
Item ID: 01173425
Item Type: Constructed Response

Answer Key:
Max. score points: 3
Standard: AI.P.3
Reporting Category: Patterns, Relations & Algebra



Which statement describes the range of the function shown?

$$f(x) = |x|$$

- A** All real numbers
- B** All real numbers greater than zero
- C** All real numbers greater than or equal to zero
- D** All real numbers less than or equal to zero

Content: Mathematics
Item Number: 67
Item ID: 01173455
Item Type: Multiple Choice

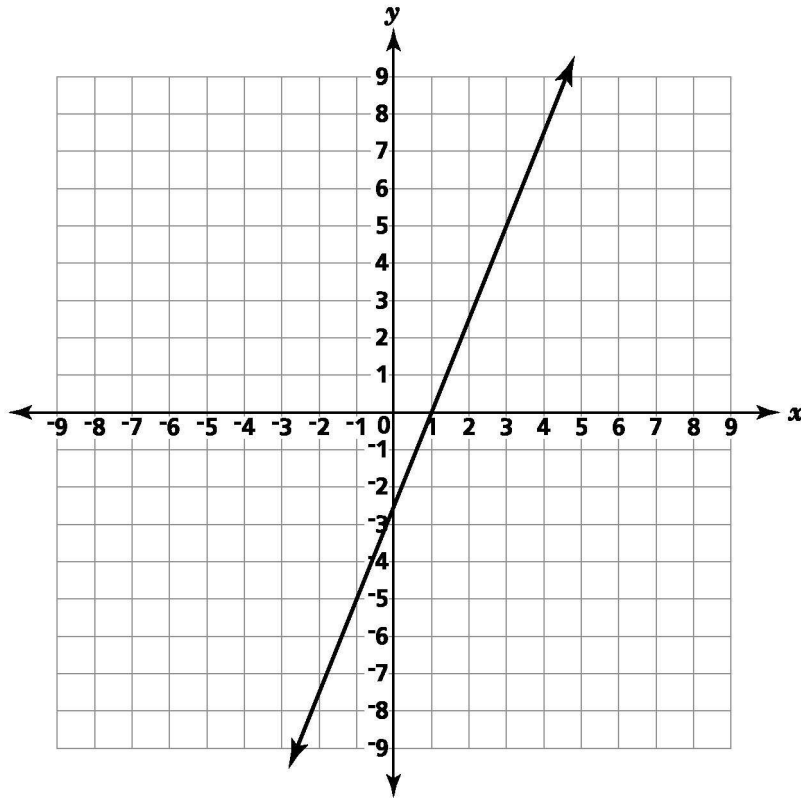
Answer Key: C
Max. score points: 1
Standard: AI.P.3
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Look at the graph below.



What is the slope of the line shown in the graph?

- F** $-\frac{5}{2}$
- G** $-\frac{2}{5}$
- H** $\frac{2}{5}$
- J** $\frac{5}{2}$

Content: Mathematics
Item Number: 16
Item ID: 01173423
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: AI.P.5
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education



DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The equation below represents a line.

$$y - 4 = 3x$$

What is the y -intercept?

F -4

G -3

H 3

J 4

Content: Mathematics
Item Number: 18
Item ID: 01011233
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: AI.P.5
Reporting Category: Patterns, Relations & Algebra

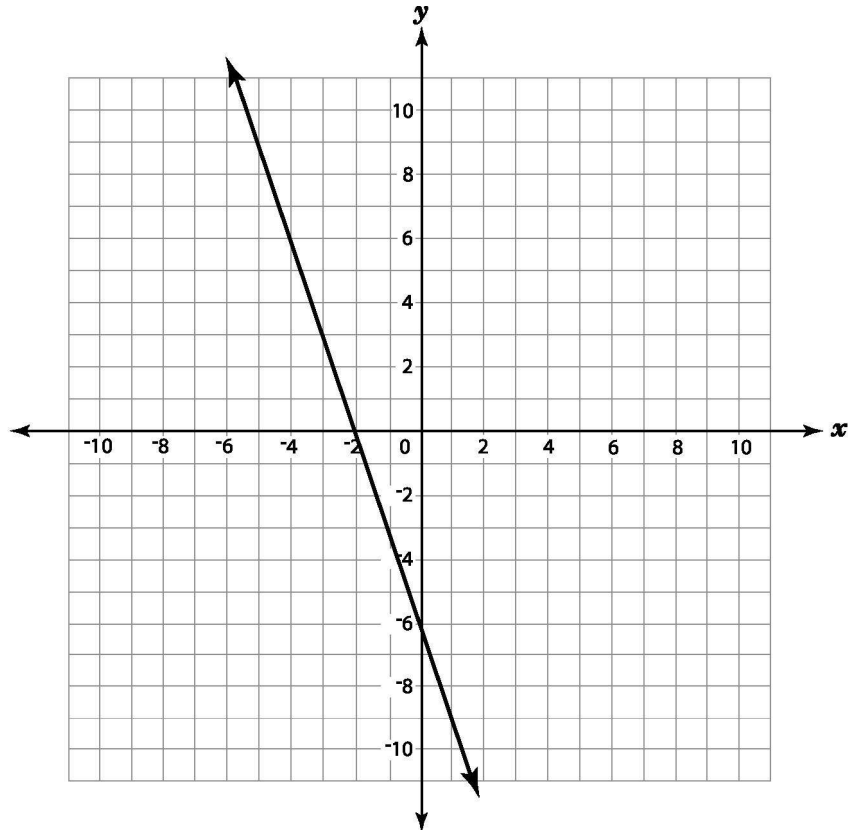


Office of the State Superintendent of Education



DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Which equation represents the line shown below?



- F** $y - 3 = -6x$
- G** $y - 6 = -3x$
- H** $y = -3x - 6$
- J** $y = -6x - 3$

Content: Mathematics
Item Number: 50
Item ID: 01011285
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: AI.P.6
Reporting Category: Patterns, Relations & Algebra



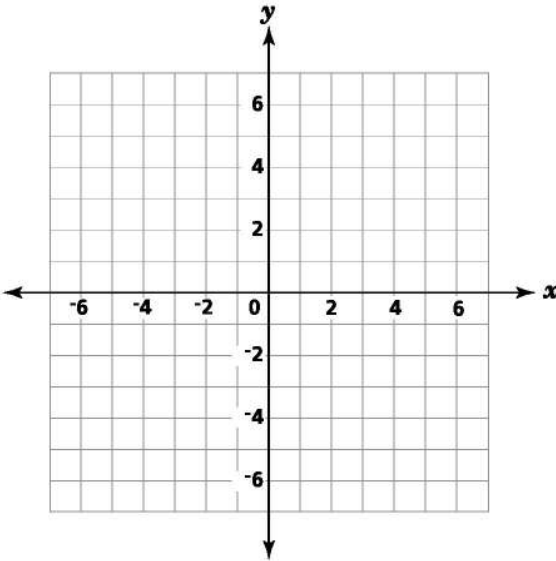
A Look at the equation below.

$$y = 3x - 2$$

On the coordinate grid in the answer booklet, graph this equation.

B What are the x - and y -intercepts of this line? Write your answer on the lines in the answer booklet.

A



B x -intercept _____

y -intercept _____

Content: Mathematics
Item Number: 59
Item ID: 01011275
Item Type: Constructed Response

Answer Key:
Max. score points: 3
Standard: AI.P.6
Reporting Category: Patterns, Relations & Algebra

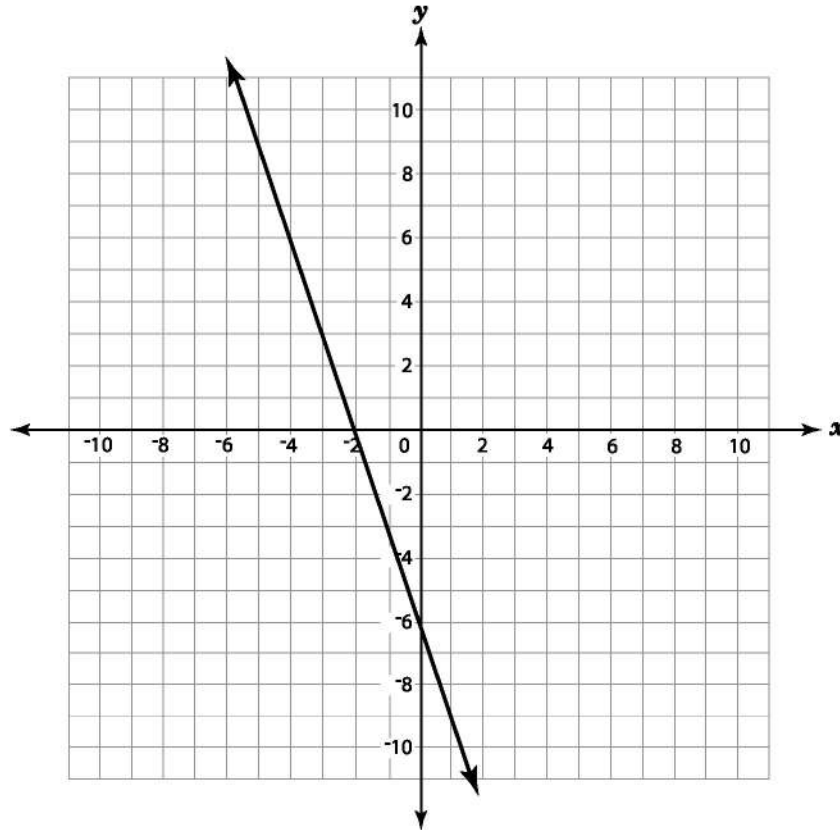


Office of the State Superintendent of Education



DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Which equation represents the line shown below?



F $y - 3 = -6x$

G $y - 6 = -3x$

H $y = -3x - 6$

J $y = -6x - 3$

Content: Mathematics
Item Number: 50
Item ID: 01011285
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: AI.P.6
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education



DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

What is the sum of $(5x^3 + 2x^2 - x + 7) + (3x^2 - 4x + 7) + (-x^3 + 4x^2 - 8)$?

- A** $4x^3 + 4x^2x + 6$
- B** $13x^3x^2 - 5x + 6$
- C** $4x^3 + 9x^2 - 5x + 6$
- D** $6x^3 + 9x^2 - 5x + 22$

Content: Mathematics
Item Number: 21
Item ID: 00790031
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: AI.P.8
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Simplify the expression below.

$$(-3x + 2)(x - 4)$$

F $-3x^2 - 10x - 8$

G $-3x^2 + 2x - 8$

H $-3x^2 + 12x - 8$

J $-3x^2 + 14x - 8$

Content: Mathematics
Item Number: 24
Item ID: 01011241
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: AI.P.8
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Simplify the expression below.

$$2[(2x + 1) + (x^2 + x - 1)]$$

F $8x^3$

G $x^2 + 5x + 1$

H $5x^3$

J $2x^2 + 6x$

Content: Mathematics
Item Number: 34
Item ID: 01173429
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: AI.P.8
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Simplify: $\frac{2x^3y^2 + 4x^2z}{2x^4}$

A $\frac{xy^2 + 2z}{x^2}$

B $\frac{y^2 + 4x^2z}{x}$

C $\frac{2x^3y^2 + 2z}{x^2}$

D $\frac{2y^2 + xz}{x}$

Content: Mathematics
Item Number: 13
Item ID: 01011279
Item Type: Multiple Choice

Answer Key: A
Max. score points: 1
Standard: AI.P.9
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

What are the factors of $x^2 + 3x - 18$?

- A** $(x + 9)(x - 2)$
- B** $(x + 3)(x - 6)$
- C** $(x - 3)(x + 6)$
- D** $(x - 9)(x + 6)$

Content: Mathematics
Item Number: 55
Item ID: 00882637
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: AI.P.9
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

- A** Simplify the expression $(x - 2)(x^2 + 2x + 4) - 2x^3 - 8$. Show your work in the box in the answer booklet and write your answer on the lines.
- B** What are the factors of $(64 - 4x^2)$? Show your work in the box in the answer booklet and write your answer on the lines.

A	<div style="border: 1px solid black; height: 150px; width: 100%;"></div> <hr style="width: 20%; margin-left: auto; margin-right: 0;"/>
B	<div style="border: 1px solid black; height: 150px; width: 100%;"></div> <hr style="width: 20%; margin-left: auto; margin-right: 0;"/>

Content: Mathematics
Item Number: 32
Item ID: 01173447
Item Type: Constructed Response

Answer Key:
Max. score points: 3
Standard: AI.P.9
Reporting Category: Patterns, Relations & Algebra

Barry is painting a banner whose length is 2 inches greater than its width. The equation below can be used to find the width, x , of the banner.

$$x^2 + 2x = 120$$

What is the width of the banner?

- A** 8 inches
- B** 10 inches
- C** 11 inches
- D** 12 inches

Content: Mathematics
Item Number: 67
Item ID: 01173433
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: AI.P.11
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Simplify the expression below.

$$\frac{2x - 2}{2x} \cdot \frac{4x}{x - 1}$$

F $\frac{-8x}{x - 1}$

G $\frac{2(x - 2)}{x - 1}$

H 2

J 4

Content: Mathematics
Item Number: 34
Item ID: 01173451
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: AI.P.11
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

What are the solutions to the quadratic equation below?

$$x^2 - 4x = 12$$

F $x = -4$ or $x = 3$

G $x = -6$ or $x = 2$

H $x = -3$ or $x = 4$

J $x = -2$ or $x = 6$

Content: Mathematics
Item Number: 46
Item ID: 00882601
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: AI.P.12
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

What are the solutions to the equation below?

$$x^2 + 7x = -10$$

F -10, 7

G -7, 10

H -5, -2

J 5, 2

Content: Mathematics
Item Number: 52
Item ID: 01011303
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: AI.P.12
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

What are the solutions to the quadratic equation below?

$$x^2 - 4x = 12$$

F $x = -4$ or $x = 3$

G $x = -6$ or $x = 2$

H $x = -3$ or $x = 4$

J $x = -2$ or $x = 6$

Content: Mathematics
Item Number: 46
Item ID: 00882601
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: AI.P.12
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Which of these is the solution for the inequality below?

$$2 + |2x - 4| < 8$$

- A** $x < 5$
- B** $x < 7$
- C** $-1 < x < 5$
- D** $3 < x < 7$

Content: Mathematics
Item Number: 15
Item ID: 01173443
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: AI.P.13
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Jamal uses the information in the table to determine the frequency in Hertz (Hz) of each string of his musical instrument.

Musical Tuning

String	Frequency (in Hertz)
5 th	440
4 th	$440(1.3)$
3 rd	$440(1.3)^2$
2 nd	
1 st	

If this pattern continues for the rest of the strings, which equation represents the frequency of his first string?

- F** $\text{Hz} \approx 440 \times 1.3$
- G** $\text{Hz} \approx (440)^4 \times 1.3$
- H** $\text{Hz} \approx 440 \times (1.3)^4$
- J** $\text{Hz} \approx 440 \times 4(1.3)$

Content: Mathematics
Item Number: 10
Item ID: 00882585
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: AI.P.14
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Amanda walked dogs and worked as a pool attendant during her summer vacation. She was paid by the hour for both jobs. The table below shows the amount of money she earned over two days.

Number of Hours Worked		Total Amount Earned
Pool Attendant	Walking Dogs	
4	1	\$42
3	2	\$39

What was her salary per hour as a pool attendant?

- F** \$6
- G** \$7.80
- H** \$8.40
- J** \$9

Content: Mathematics
Item Number: 70
Item ID: 01173461
Item Type: Multiple Choice

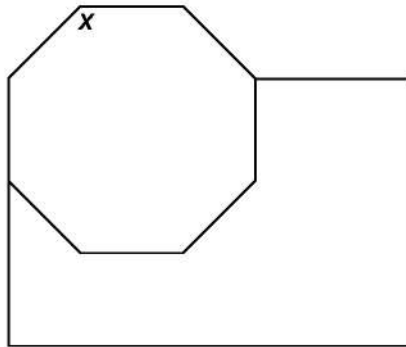
Answer Key: J
Max. score points: 1
Standard: AI.P.15
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

A regular polygon forms a part of the deck shown below.



What is the measure of the angle marked X in this polygon?

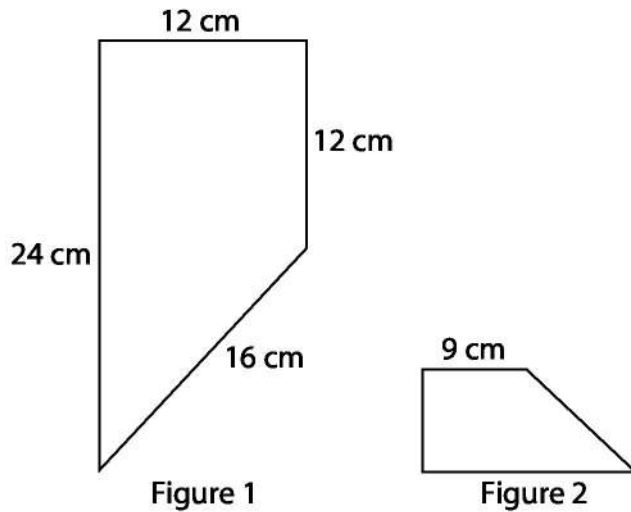
- A** 120°
- B** 135°
- C** 150°
- D** 240°

Content: Mathematics
Item Number: 53
Item ID: 01011257
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: G.G.3
Reporting Category: Geometry



The two figures below are similar.



Note: The figures are not drawn to scale.

What is the perimeter of Figure 2?

45 cm

F

48 cm

G

52 cm

H

55 cm

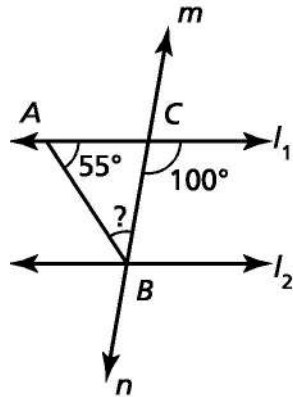
J

Content: Mathematics
Item Number: 36
Item ID: 01011249
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: G.G.7
Reporting Category: Geometry



In the figure below line 1 is parallel to line 2.



What is the measure of $\angle ABC$?

- F** 125°
- G** 100°
- H** 45°
- J** 35°

Content: Mathematics
Item Number: 68
Item ID: 01173435
Item Type: Multiple Choice

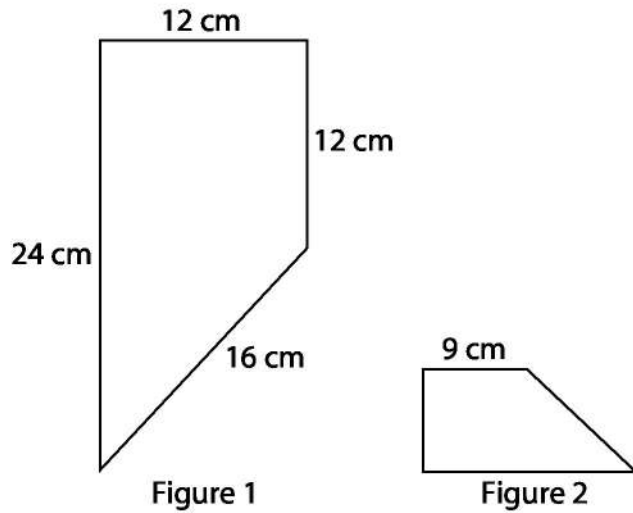
Answer Key: H
Max. score points: 1
Standard: G.G.7
Reporting Category: Geometry



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The two figures below are similar.



Note: The figures are not drawn to scale.

What is the perimeter of Figure 2?

45 cm

F

48 cm

G

52 cm

H

55 cm

J

Content: Mathematics
Item Number: 36
Item ID: 01011249
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: G.G.7
Reporting Category: Geometry



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Aaron is making a scale model of a building. He wants his model to be similar to the actual building. The front of the building is a rectangle that is 120 feet wide and 600 feet tall. Aaron made his model 5 inches wide. How tall should Aaron make the model?

- F** 1 inch
- G** 12 inches
- H** 20 inches
- J** 25 inches

Content: Mathematics
Item Number: 38
Item ID: 00882603
Item Type: Multiple Choice

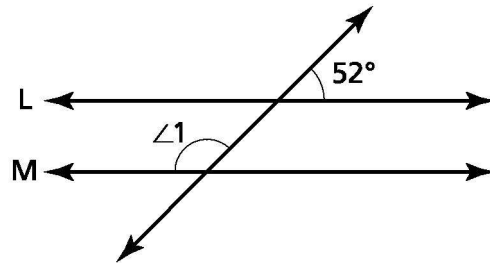
Answer Key: J
Max. score points: 1
Standard: G.G.12
Reporting Category: Geometry



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

In the diagram below, line L is parallel to line M.



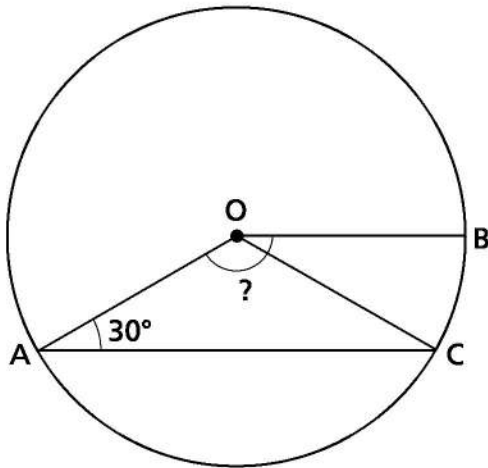
What is the measure of $\angle 1$?

- A** 48°
- B** 52°
- C** 128°
- D** 132°

Content: Mathematics
Item Number: 25
Item ID: 00882631
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: G.G.13
Reporting Category: Geometry

The figure below shows a circle with center O . \overline{OB} is parallel to \overline{AC} .



What is the measure of $\angle AOB$?

- A** 120°
- B** 135°
- C** 150°
- D** 170°

Content: Mathematics
Item Number: 33
Item ID: 01173449
Item Type: Multiple Choice

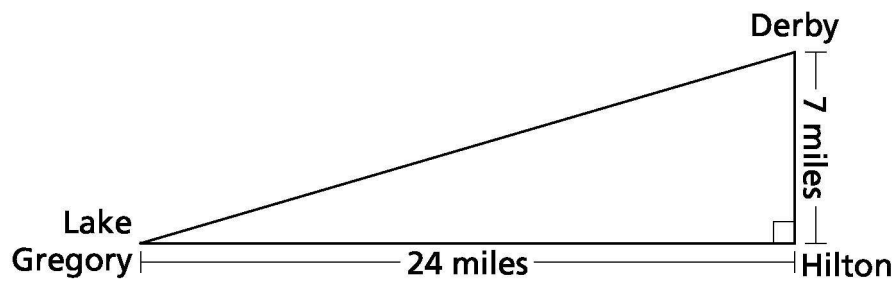
Answer Key: C
Max. score points: 1
Standard: G.G.13
Reporting Category: Geometry



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

On the map below, Lake Gregory is due west of Hilton and Derby is due north of Hilton.



What is the distance between Lake Gregory and Derby?

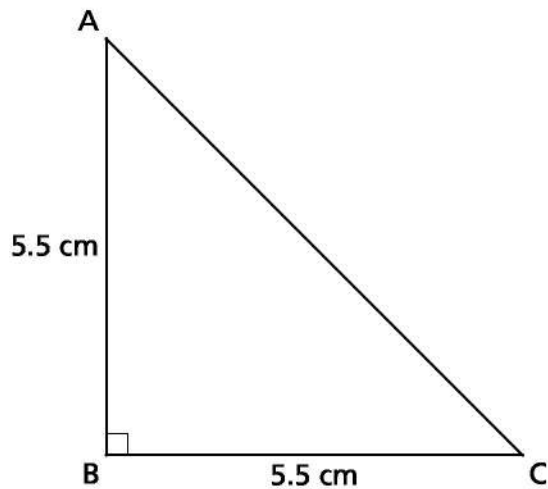
- F** 17 miles
- G** 25 miles
- H** 28 miles
- J** 31 miles

Content: Mathematics
Item Number: 4
Item ID: 00882607
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: G.G.14
Reporting Category: Geometry



Look at the figure shown below.



Which of these is the length, in centimeters (cm), of \overline{AC} to the nearest tenth?

- F** 11.0
- G** 8.5
- H** 7.8
- J** 5.5

Content: Mathematics
Item Number: 42
Item ID: 01173305
Item Type: Multiple Choice

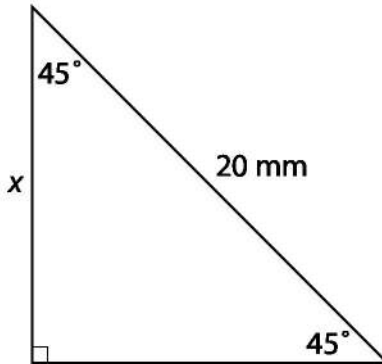
Answer Key: H
Max. score points: 1
Standard: G.G.14
Reporting Category: Geometry



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Look at the right triangle below.



Note: The figure is not drawn to scale.

What is the length of side x ?

- A** 10 mm
- B** $10\sqrt{2}$ mm
- C** 20 mm
- D** $20\sqrt{2}$ mm

Content: Mathematics
Item Number: 45
Item ID: 01011253
Item Type: Multiple Choice

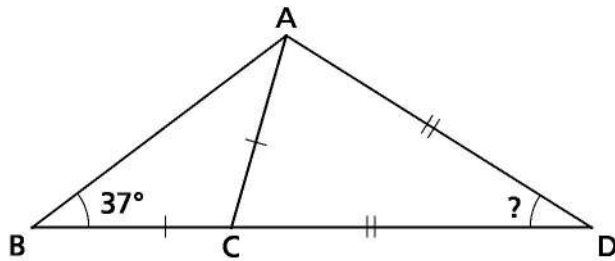
Answer Key: B
Max. score points: 1
Standard: G.G.15
Reporting Category: Geometry



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The figure below shows two isosceles triangles, $\triangle ABC$ and $\triangle ACD$.



What is the measure of $\angle ADC$?

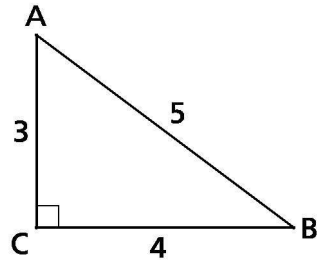
- F** 32°
- G** 37°
- H** 53°
- J** 74°

Content: Mathematics
Item Number: 68
Item ID: 01173457
Item Type: Multiple Choice

Answer Key: F
Max. score points: 1
Standard: G.G.15
Reporting Category: Geometry



Look at the figure below.



Which of these is the cosine of $\angle B$?

F $\frac{3}{4}$

G $\frac{3}{5}$

H $\frac{4}{3}$

J $\frac{4}{5}$

Content: Mathematics
Item Number: 60
Item ID: 00882577
Item Type: Multiple Choice

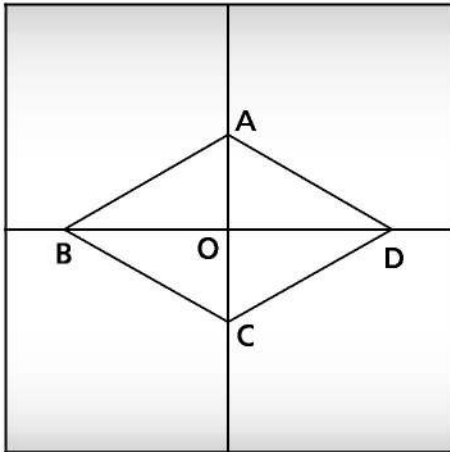
Answer Key: J
Max. score points: 1
Standard: G.G.16
Reporting Category: Geometry



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The figure below shows the design on a throw pillow.



The measure of $\angle ABO$ is 30° . The length of $\overline{AO} = 3$ inches. What is the length, in inches, of \overline{AB} ?

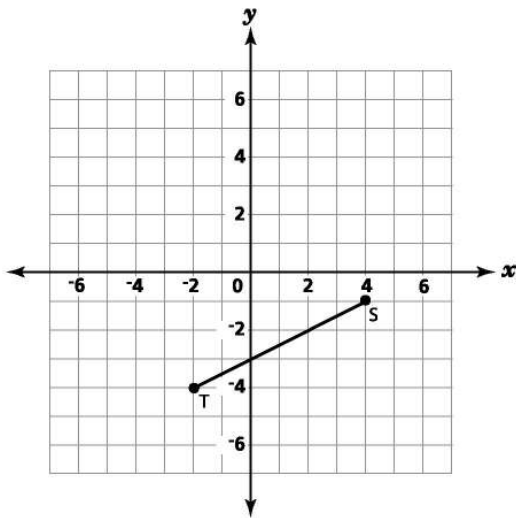
- A** 3.5
- B** 5
- C** 6
- D** 7.5

Content: Mathematics
Item Number: 41
Item ID: 01173313
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: G.G.16
Reporting Category: Geometry



Use the graph and formulas below to answer the following questions.



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

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

- A** What is the midpoint of \overline{ST} ? Show your work in the box in the answer booklet and write your answer on the line.
- B** What is the distance between points S and T? Round your answer to the nearest tenth. Show your work in the box in the answer booklet and write your answer on the line.
- C** What is the slope of \overline{ST} ? Show your work in the box in the answer booklet and write your answer on the line.

Content: Mathematics
 Item Number: 6
 Item ID: 01011293
 Item Type: Constructed Response

Answer Key:
 Max. score points: 3
 Standard: G.G.18
 Reporting Category: Geometry



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
 MAYOR ADRIAN M. FENTY

A

B

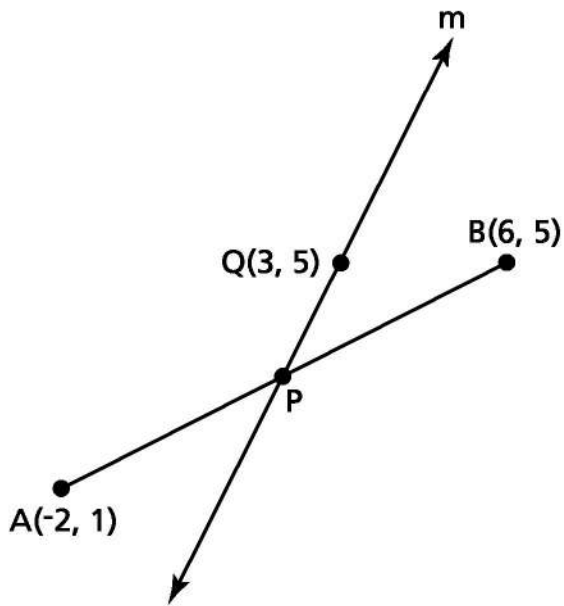
C

Content: Mathematics
Item Number: 6
Item ID: 01011293
Item Type: Constructed Response

Answer Key:
Max. score points: 3
Standard: G.G.18
Reporting Category: Geometry



The figure below shows line m intersecting the midpoint of line segment AB at point P .



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

What is the slope of line m if it passes through point $Q(3, 5)$?

F -3

G $-\frac{1}{3}$

H $\frac{1}{2}$

J 2

Content: Mathematics
Item Number: 14
Item ID: 01173441
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: G.G.18
Reporting Category: Geometry

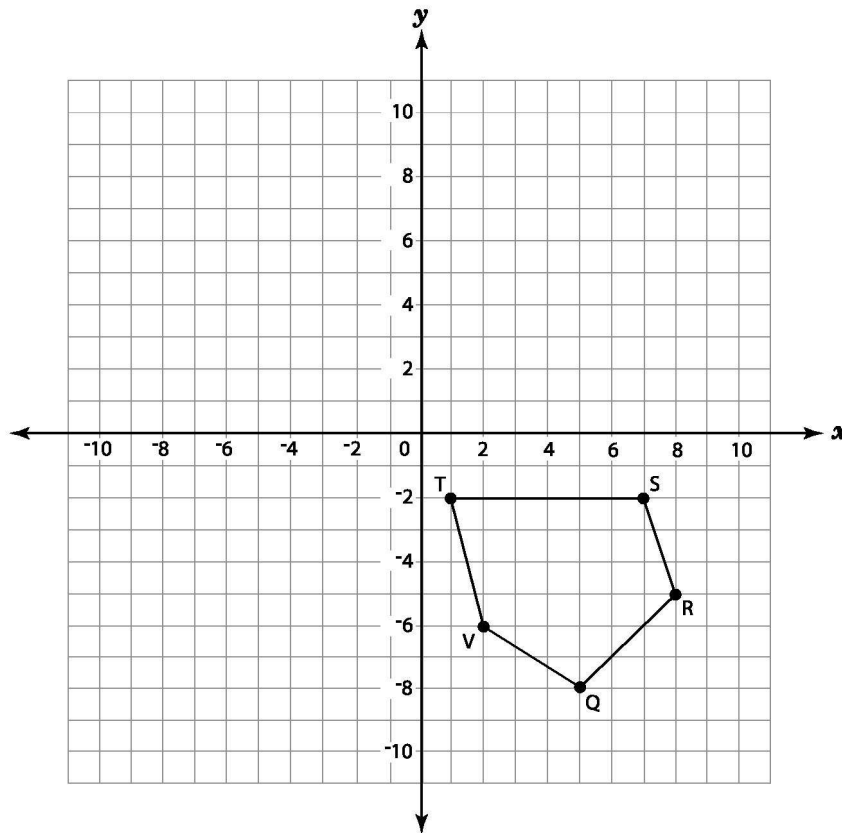


Office of the State Superintendent of Education



DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Figure QRSTV is shown on the coordinate plane below.



- Figure QRSTV is reflected across the y-axis.
- The resulting figure is then reflected across the x-axis.

What are the coordinates of vertex Q after both reflections?

- A** $(-5, 8)$
- B** $(8, -5)$
- C** $(-5, -8)$
- D** $(-8, -5)$

Content: Mathematics
Item Number: 9
Item ID: 01011281
Item Type: Multiple Choice

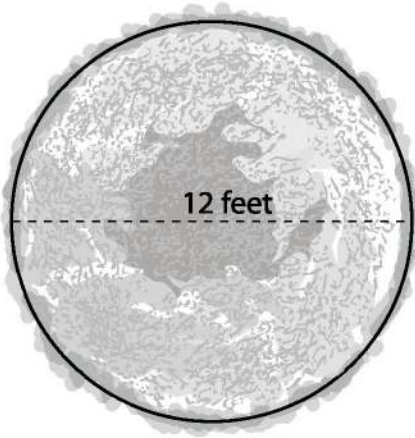
Answer Key: A
Max. score points: 1
Standard: G.G.20
Reporting Category: Geometry



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

A circular hedge is shown below.



To the nearest tenth of a foot, what is the circumference of the hedge?

18.8 feet

A

37.7 feet

B

130.1 feet

C

452.4 feet

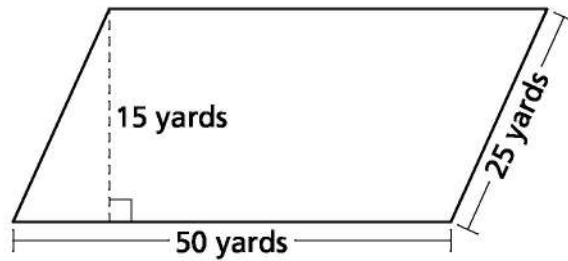
D

Content: Mathematics
Item Number: 1
Item ID: 01011247
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: G.G.22
Reporting Category: Measurement



Look at the parallelogram below.



Note: The figure is not drawn to scale.

What is the perimeter of the parallelogram?

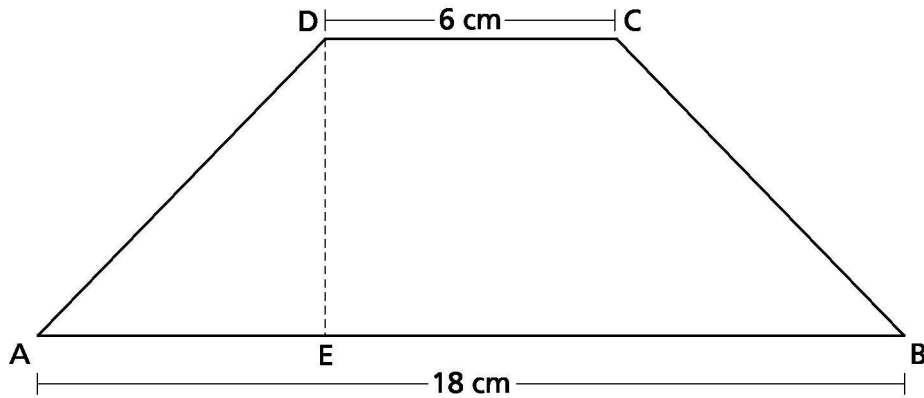
- A** 65 yards
- B** 75 yards
- C** 130 yards
- D** 150 yards

Content: Mathematics
Item Number: 3
Item ID: 00882615
Item Type: Multiple Choice

Answer Key: D
Max. score points: 1
Standard: G.G.22
Reporting Category: Measurement



The figure below shows trapezoid ABCD.



The area of the trapezoid is 84 square centimeters. What is the height, in centimeters, of the trapezoid?

- F** 7
- G** 10
- H** 12
- J** 14

Content: Mathematics
Item Number: 40
Item ID: 01173301
Item Type: Multiple Choice

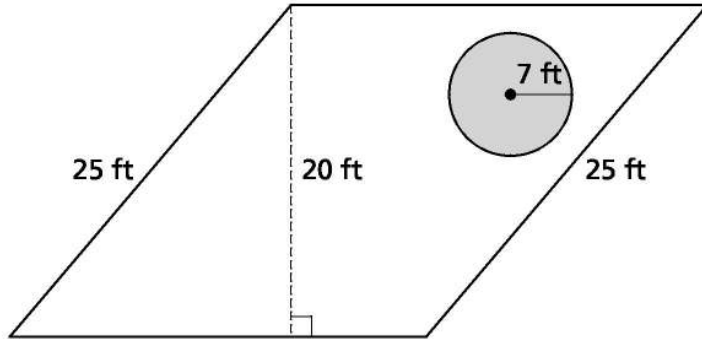
Answer Key: F
Max. score points: 1
Standard: G.G.22
Reporting Category: Measurement



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The figure below shows some of the dimensions of a lawn that a landscape artist is designing. The lawn is in the shape of a parallelogram with a circular fountain in one of its corners.



- A** What area, in square feet (rounded to the nearest whole number), is covered by the base of the fountain? Show your work in the box in the answer booklet and write your answer on the line.
- B** The perimeter of the lawn is 98 feet. What is the area, in square feet, of the lawn, excluding the area for the base of the fountain? Show your work in the box in the answer booklet and write your answer on the line.

A

_____ square feet

B

_____ square feet

Content: Mathematics
Item Number: 43
Item ID: 01173307
Item Type: Constructed Response

Answer Key:
Max. score points: 3
Standard: G.G.22
Reporting Category: Measurement

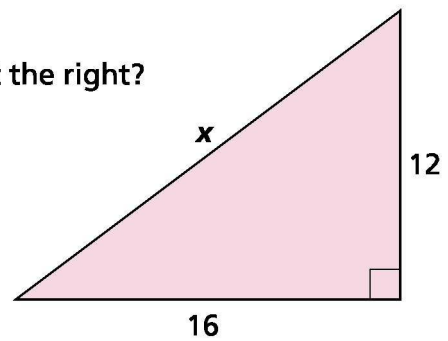


Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

What is the missing side length in the triangle shown at the right?

- A** 18
- B** 20
- C** 24
- D** 28

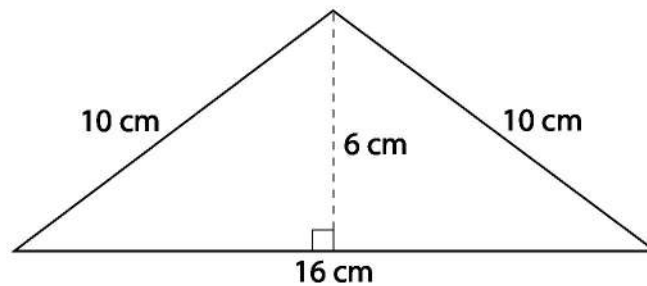


Content: Mathematics
Item Number: 49
Item ID: 00539689
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: G.G.22
Reporting Category: Measurement



What is the area of the triangle shown below?



Note: The figure is not drawn to scale.

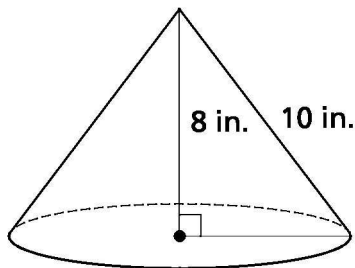
- F** 36 cm²
- G** 48 cm²
- H** 80 cm²
- J** 96 cm²

Content: Mathematics
Item Number: 58
Item ID: 01011301
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: G.G.22
Reporting Category: Measurement



Look at the figure of the cone below.



$$\text{Volume} = \frac{1}{3} \pi r^2 h$$

$$\text{Surface Area} = \pi r s + \pi r^2$$

r = radius, h = height and s = slant height

The volume of the cone is 96π cubic inches. What is the surface area, in square inches, of the cone, excluding the area of its base?

- F** 36π
- G** 48π
- H** 60π
- J** 80π

Content: Mathematics
Item Number: 40
Item ID: 01173311
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: G.G.23
Reporting Category: Measurement



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY