



**Algebra 1**  
**End-of-Course Assessment**  
**Sample Questions**

*Answer Key*

## Sample Item 1

MC

As a diver swims deeper underwater, the water pressure in pounds per square inch (PSI) increases on the diver. The table below shows the pressure in PSI for several depths of water.

WATER PRESSURE

Depth (in feet)	Pressure (in PSI)
10	4.3
20	8.6
30	12.9
40	17.2
50	21.5

Which equation represents  $p$ , the water pressure in square inches, as a function of  $d$ , the depth in feet?

- A.  $p = 4.3d$
- ★ B.  $p = 0.43d$
- C.  $p = 23.3d$
- D.  $p = 2.33d$

## Sample Item 5

MC

Mario needs to cut three book shelves from a board that is 1.8 meters long. The second shelf is 15 centimeters longer than twice the length of the first shelf. The remaining shelf is 5 centimeters longer than the first shelf. The equation below represents this situation, where  $x$  is the length of the first shelf in meters.

$$x + (2x + 0.15) + (x + 0.05) = 1.8$$

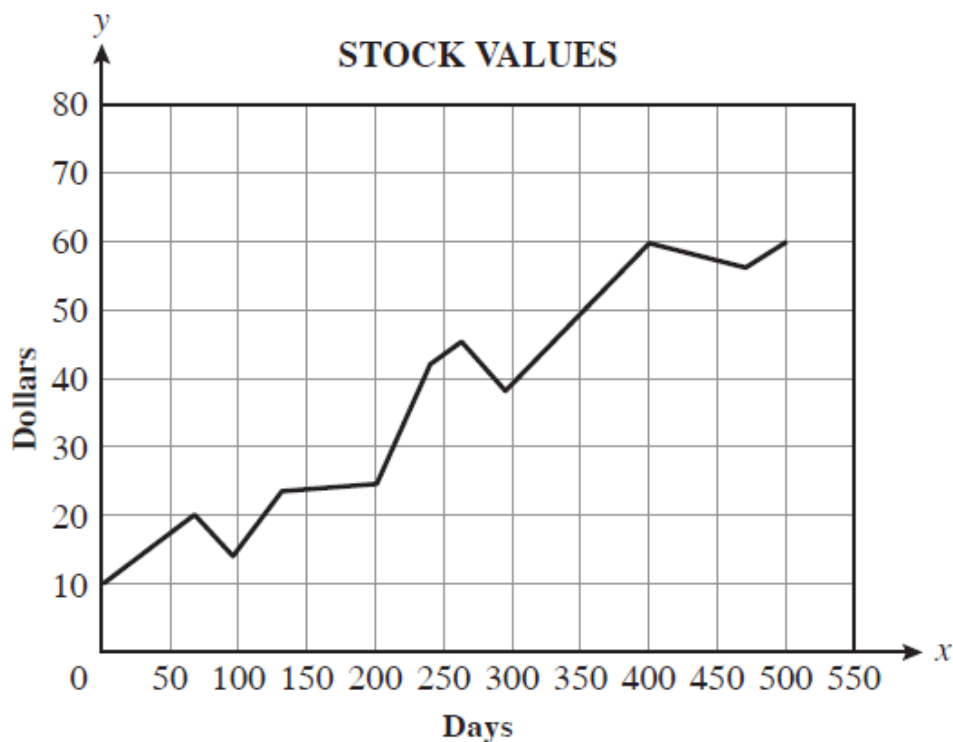
Which of the following is the length, in meters, of the first shelf?

- ★ A. 0.40
- B. 0.45
- C. 0.53
- D. 0.96

## Sample Item 3

MC

An economics teacher plotted the value of a stock on 11 different days during a 500-day period and used line segments to connect them. In the graph below, the horizontal axis is measured in days and the vertical axis is measured in dollars.



Based on the graph, which of the following best describes the range of the value of the stock for this 500-day period?

- A.  $0 \leq x \leq 500$
- B.  $1 \leq x \leq 500$
- ★ C.  $10 \leq y \leq 60$
- D.  $0 \leq y \leq 80$

Which shows the equation  $n = 8 + 5m$  solved for  $m$ ?

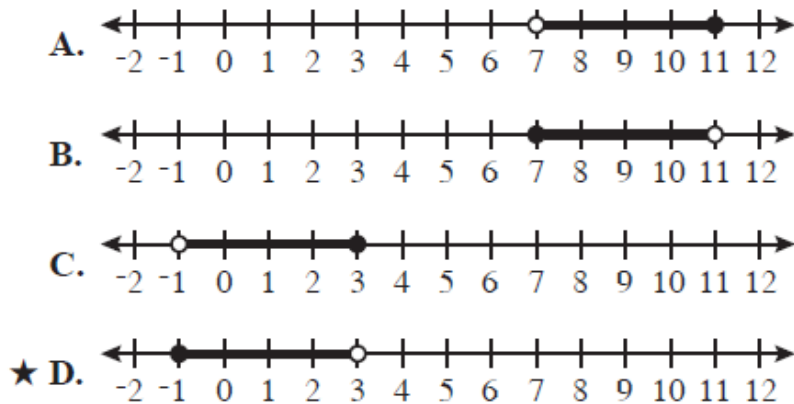
- A.  $m = \frac{n-5}{8}$
- ★ B.  $m = \frac{n-8}{5}$
- C.  $m = \frac{n+8}{5}$
- D.  $m = \frac{5n}{8}$

## Sample Item 9

MC

Which graph shows the solution to the inequality shown below?

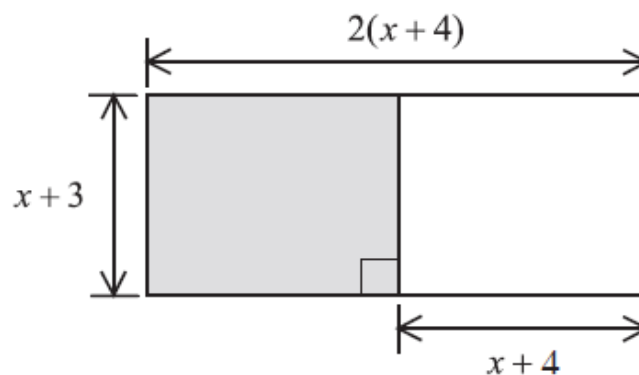
$$15 \leq 7n - 2(n - 10) < 35$$



## Sample Item 23

MC

Which expression is equivalent to the perimeter of the shaded portion of the rectangle?



- A.  $2x + 10$   
 B.  $2x + 12$   
 ★ C.  $4x + 14$   
 D.  $8x + 28$

## Sample Item 10

## MC

The out-of-pocket costs to an employee for health insurance and medical expenses for one year are shown in the table below.

**EMPLOYEE'S ANNUAL HEALTH CARE COSTS**

Type of Cost	Definition	Cost to Employee
Premium	Total amount employee pays insurance company for the policy	\$3,626
Deductible	Amount of medical expenses employee pays before insurance company pays for anything	\$500
Co-payment	Percentage of medical expenses after the first \$500 that employee has to pay	20%

According to the plan outlined in the table, total annual health care costs,  $C$ , depend on the employee's medical expenses for that year. If  $x$  represents the total medical expenses of an employee on this plan and  $x \geq 500$ , which of the following equations can be used to determine this employee's total health care costs for that year?

- A.  $C = 3,626 - 500 + 0.20(x - 500)$
- B.  $C = 3,626 - 500 + 0.20x$
- ★ C.  $C = 3,626 + 500 + 0.20(x - 500)$
- D.  $C = 3,626 + 500 + 0.20x$

An architect designed an outdoor staircase for a house. The relationship between the height of the steps and the length of the tread is modeled by the equation  $57x - 95y = 0$ .

Which of the following represents the slope of the equation?

- A.  $\frac{5}{3}$
- B.  $\frac{3}{2}$
- C.  $\frac{2}{3}$
- ★ D.  $\frac{3}{5}$

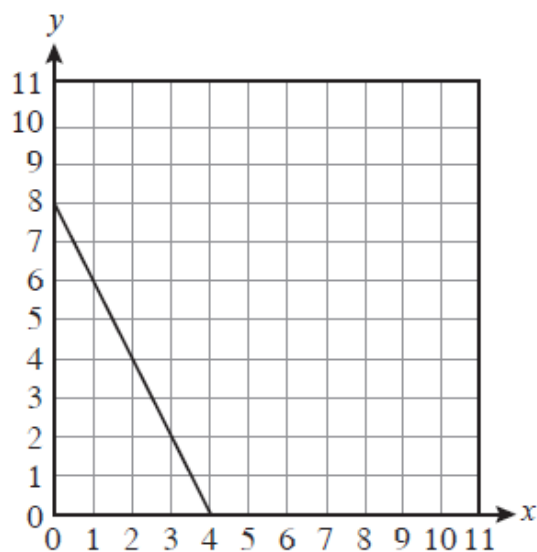
## Sample Item 12

MC

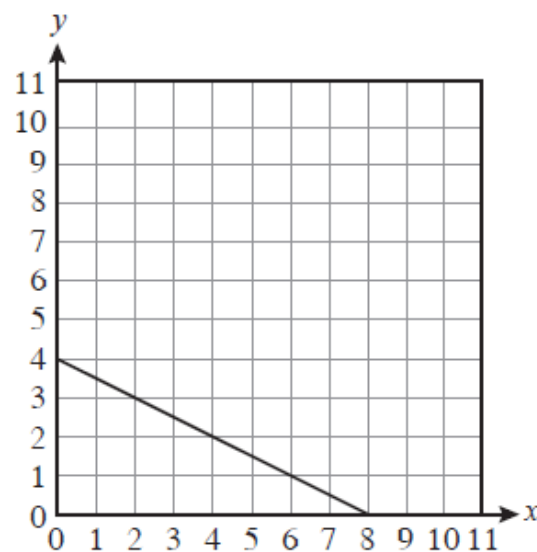
Roger went to a garage sale where hardback books sold for \$5 each and paperback books sold for \$2.50 each. He has \$20 to spend. The equation below can be used to find how many books of each type Roger can buy, where  $x$  is the number of hardback books and  $y$  is the number of paperback books.

$$5x + 2.5y = 20$$

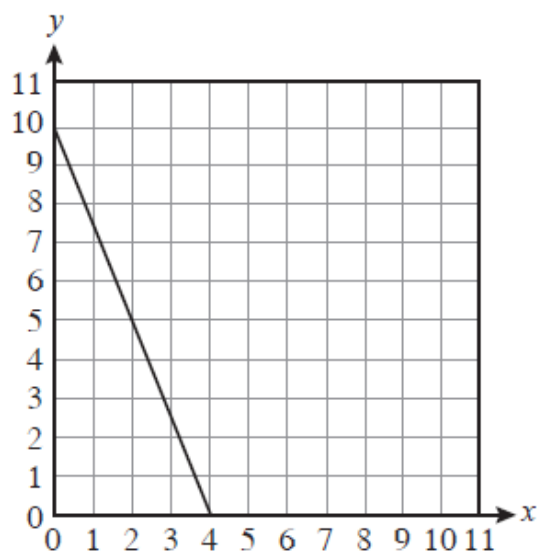
Which of the following shows the graph of this equation?



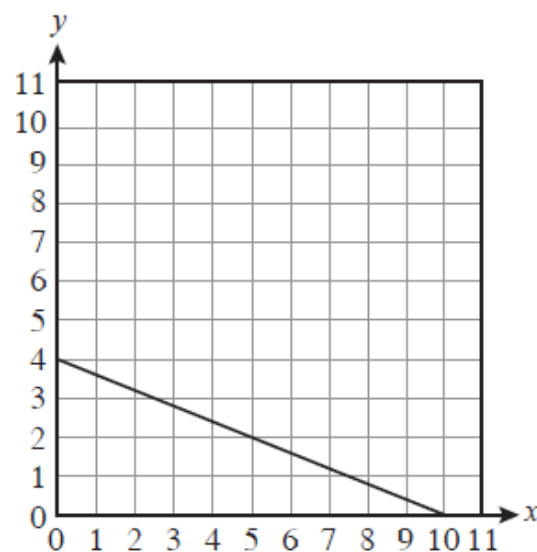
★ A.



C.



B.

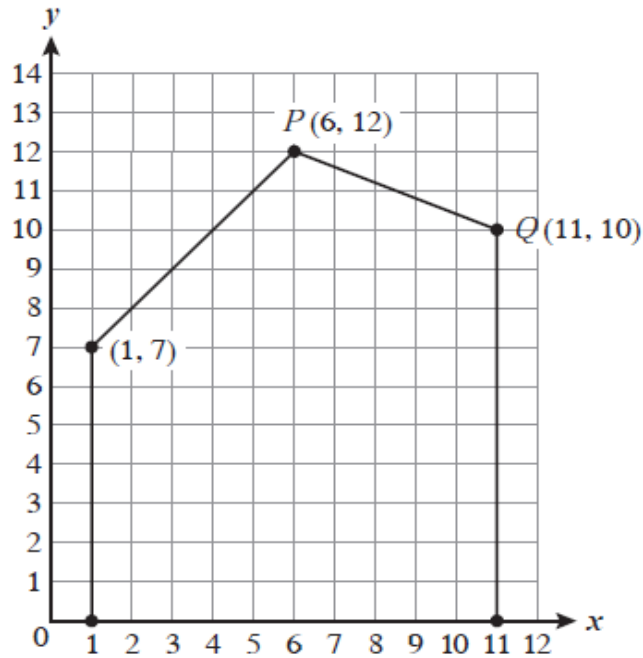


D.

## Sample Item 15

## MC

In a technical drawing class, students are analyzing the side view of a house that has been positioned on a coordinate grid, as shown below.



Which of the following equations best represents the line that contains  $\overline{PQ}$ ?

- A.  $y = -\frac{5}{2}x + 14.4$
- B.  $y = \frac{5}{2}x + 27$
- ★ C.  $y = -\frac{2}{5}x + 14.4$
- D.  $y = \frac{2}{5}x + 27$



## Sample Item 19

MC

Russ bought 3 medium and 2 large submarine sandwiches for a total of \$29.95. Stacy bought 4 medium and 1 large submarine sandwiches for a total of \$28.45.

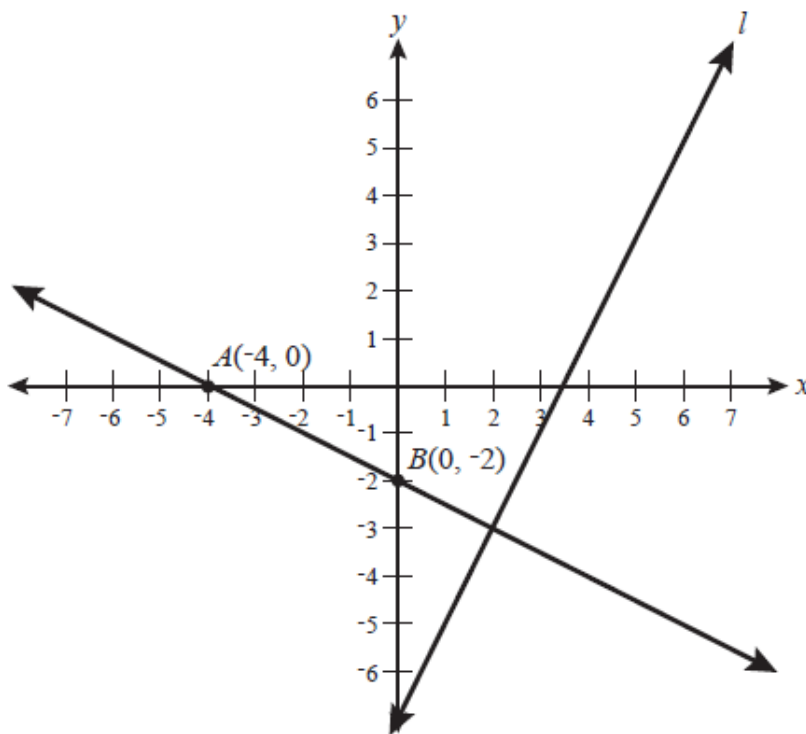
Which statement shows the cost of each medium and each large submarine sandwich?

- A. Each medium sandwich costs \$5.69 and each large sandwich costs \$6.89.
- B. Each medium sandwich costs \$5.69 and each large sandwich costs \$6.39.
- ★ C. Each medium sandwich costs \$5.39 and each large sandwich costs \$6.89.
- D. Each medium sandwich costs \$5.39 and each large sandwich costs \$6.39.

## Sample Item 16

FR

On the coordinate grid below, line  $l$  is perpendicular to  $\overleftrightarrow{AB}$ .



What is the slope of line  $l$ ?

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## Sample Item 26

MC

If  $x \neq 3$ , which of the following shows the expression below in simplest form?

$$\frac{3x^2 - 27}{x - 3}$$

- ★ A.  $3(x + 3)$
- B.  $3(x - 3)$
- C.  $3(x + 9)$
- D.  $3(x - 9)$

## Sample Item 17

MC

David is training for a marathon. He writes down the time and distance for each training run and then records the data on a scatter plot. He has drawn a line of best fit on the scatter plot, as shown below.



Which statement best expresses the meaning of the slope as a rate of change for this line of best fit?

- A. It represents the number of miles he will have to run to finish the marathon.
- ★ B. It represents the average speed, in miles per hour, of his training runs.
- C. It represents the number of hours he will need to finish the marathon.
- D. It represents the distances, in miles, that he ran while he was training.

Charlie needs to simplify the expression below before he substitutes values for  $x$  and  $y$ .

$$\frac{x^{18}y^{12} + x^9y^8}{x^3y^4}$$

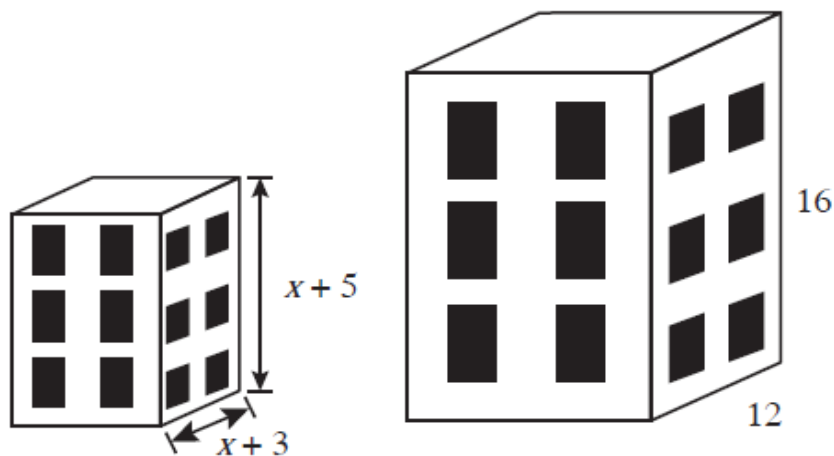
If  $x \neq 0$  and  $y \neq 0$ , which of the following is a simplified version of the expression above?

- A.  $x^9y^5$
- B.  $x^{24}y^{16}$
- C.  $x^6y^3 + x^3y^2$
- ★ D.  $x^{15}y^8 + x^6y^4$

## Sample Item 28

MC

Tammy made similar models of a building, with dimensions, in inches, as shown in the diagram below.



What is the value, in inches, of  $x$ ?

- ★ A. 3
- B. 4
- C. 5
- D. 6

Neelam simplified the expression below for a homework assignment.

$$\sqrt{12} + \sqrt{3x} + 7\sqrt{3}$$

If Neelam simplified the expression correctly, which of the following is her answer?

- ★ A.  $9\sqrt{3} + \sqrt{3x}$
- B.  $11\sqrt{3} + \sqrt{3x}$
- C.  $7\sqrt{15} + \sqrt{3x}$
- D.  $8\sqrt{15} + \sqrt{3x}$

Algebra 1 EOC

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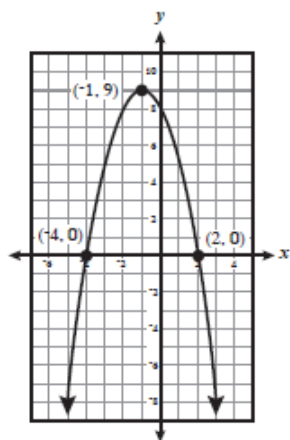
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The expression  $(m^6n^5q^3)^2$  is equivalent to which of the following?

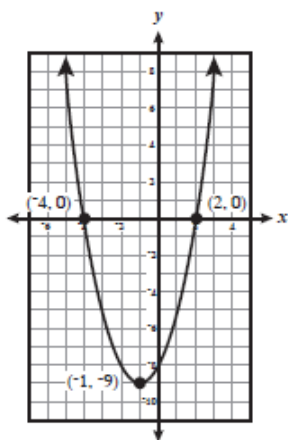
- ★ A.  $m^{12}n^{10}q^6$
- B.  $m^{36}n^{25}q^9$
- C.  $2m^8n^7q^5$
- D.  $2m^{12}n^{10}q^6$

## Sample Item 31

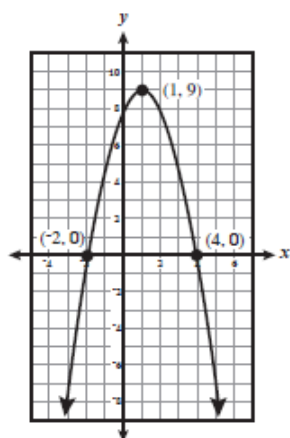
MC

Which of the following is the graph of  $y = x^2 + 2x - 8$ ?

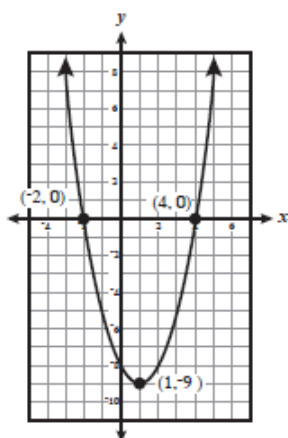
A.



★ C.



B.



D.

**Sample Item 32****MC**

Jeannie solved the quadratic equation shown below by factoring.

$$x^2 + 2x - 8 = 0$$

Which of the following shows a step in solving the equation shown?

- A.  $(x + 2)(x + 4) = 0$
- B.  $(x + 2)(x - 4) = 0$
- ★ C.  $(x - 2)(x + 4) = 0$
- D.  $(x - 2)(x - 4) = 0$

**Sample Item 35**      **FR**

Set  $D$  lists the ages of Dianna's grandchildren.

$$D = \{2, 5, 6, 8, 10, 11\}$$

Set  $K$  lists the ages of Karen's grandchildren.

$$K = \{2, 10, 18\}$$

Set  $P$  lists the ages of Patrick's grandchildren.

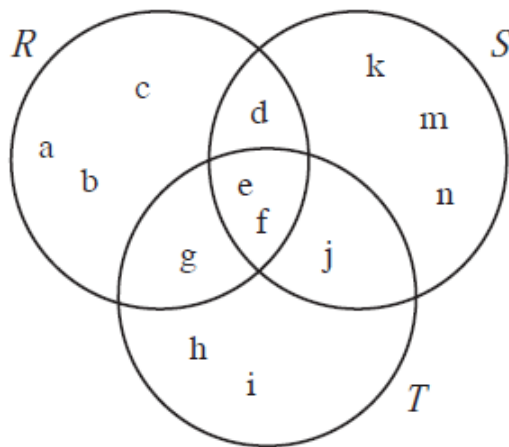
$$P = \{10, 11, 14\}$$

What is the greatest age in the set  $(K \cup P) \cap D$ ?

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**Sample Item 36**      **MC**

The universal set contains only sets  $R$ ,  $S$ , and  $T$ . These sets are related as shown in the Venn diagram below.



Which set represents  $(\sim R \cap S) \cup (\sim T \cap S)$ ?

- A.  $\{d, e, f, j\}$
- ★ B.  $\{d, j, k, m, n\}$
- C.  $\{d, e, f, j, k, m, n\}$
- D.  $\{d, e, f, g, j, k, m, n\}$