State of Texas Assessments of Academic Readiness

Algebra I

Paper Item Sampler

1 In the expression shown, x, y, and z are values where the expression is defined.

$$\frac{x^6yz^7}{xy^2z^2}$$

What is the simplest form of the expression?

Record your answer in the space provided.

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2 A quadratic function is defined as $f(x) = (x + 4)^2 - 18$. What is the equation for this function in standard form?

Record your answer in the space provided.

$f(x) =$

3 What value of m satisfies the equation $6(4m - 3) + 6 = 4(4m + 11)$?

Record your answer in the space provided.

4 The table shows the total cost of different numbers of square feet of carpet.

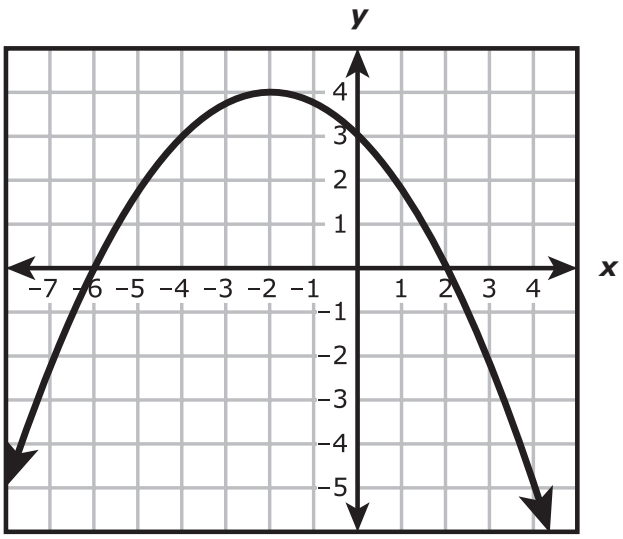
Carpet Costs

Number of Square Feet Purchased	Total Cost (dollars)
120	840
140	980
160	1,120
180	1,260

What is the rate of change of the total cost in dollars with respect to the number of square feet purchased for this linear relationship?

Record your answer in the space provided.

5 The graph represents a quadratic function.



Select **ONE** correct answer in each box to complete the sentence.

The function has a [Ⓐ minimum / Ⓑ maximum] value of [Ⓐ −6 / Ⓑ 3 / Ⓒ 4].

6 Laboratory technicians recorded the population of a species of bacteria each hour for 7 hours. The population in thousands after x hours can be modeled by the exponential function $f(x) = 575(1 + 0.40)^x$.

Select **ONE** correct answer in each box to complete each sentence.

The initial population of bacteria when the technicians began recording was

Ⓐ 805,000
Ⓑ 575,000
Ⓒ 230,000

.

The population is

Ⓐ increasing
Ⓑ decreasing

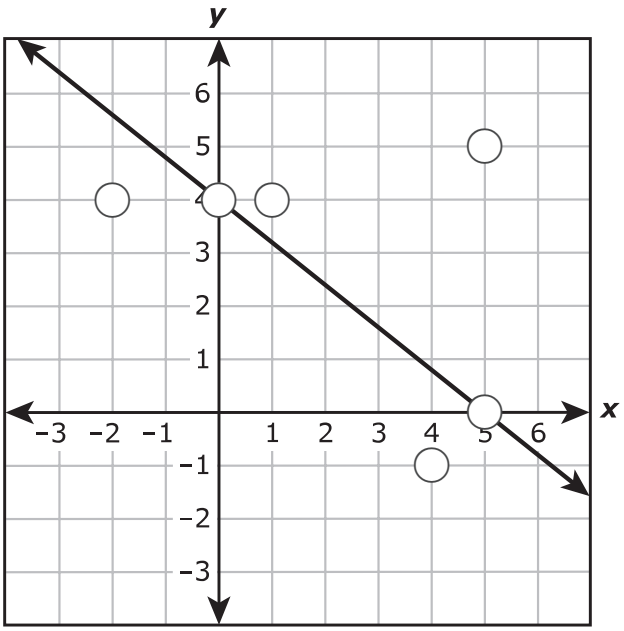
at a rate of

Ⓐ 40%
Ⓑ 140%
Ⓒ 60%

per hour.

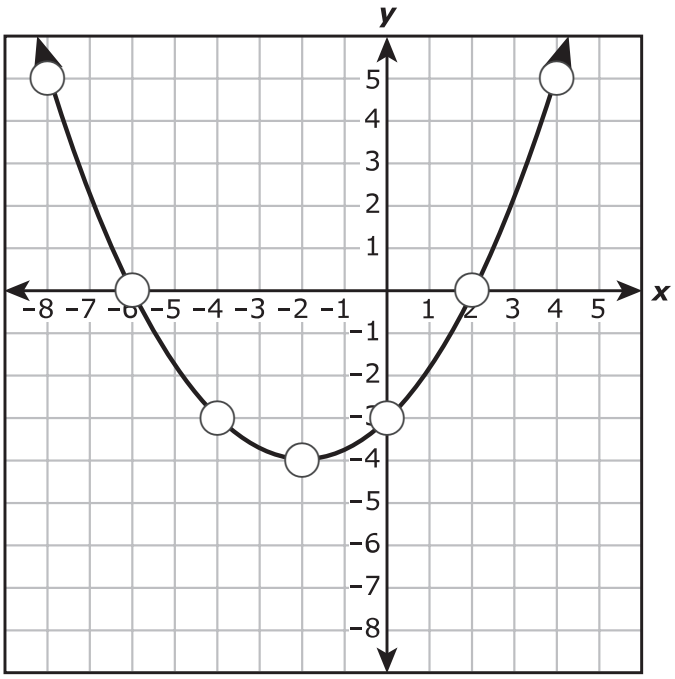
7 The graph of $4x + 5y = 20$ is shown on the grid. Which points are in the solution set of $4x + 5y < 20$?

Shade the **TWO** correct circles that represent the points.



8 The graph of a quadratic function is shown. What are the zeros of the function?

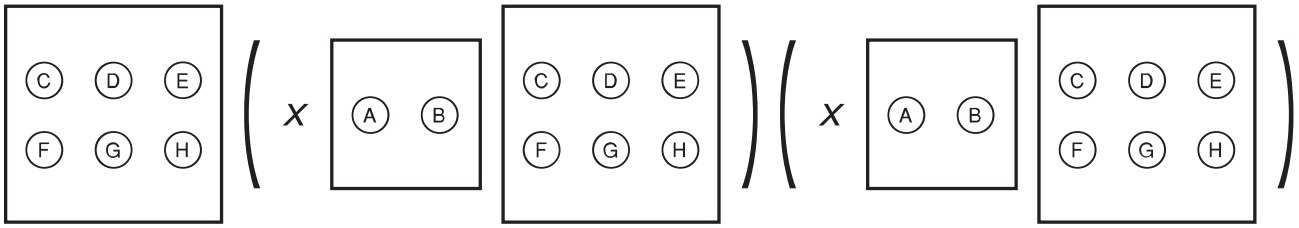
Shade the **TWO** correct circles that represent the points.



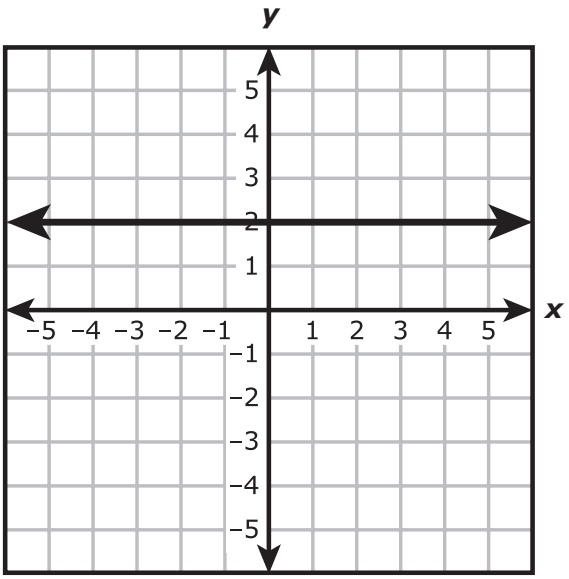
9 What is the factored form of $2x^2 - 14x + 24$?

Select the correct answer for each box. Each answer may be used more than once. Not all answers will be used.

A +		**B** −
C 2	**D** 3	**E** 4
F 6	**G** 8	**H** 12



10 The graph of a line is shown.



What are the equation and the slope of the line?

Select the correct answer for each box. Not all answers will be used.

A $x = 2$ **B** $y = 2x$ **C** $y = 2$

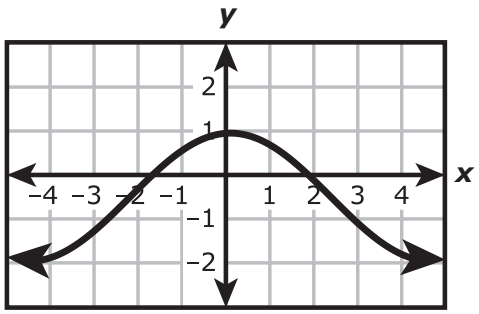
Equation: Ⓐ Ⓑ Ⓒ

D 0 **E** 2 **F** undefined

Slope: Ⓓ Ⓔ Ⓕ

11 Which of the relations shown represent y as a function of x?

Select **ONE** correct answer in each row.

Relation	Function	Not a Function
$y = -3.4x$	Ⓐ	Ⓑ
<table><tr><td>***x***</td><td>1</td><td>1</td><td>4</td><td>4</td><td>9</td><td>9</td></tr><tr><td>***y***</td><td>1</td><td>−1</td><td>2</td><td>−2</td><td>3</td><td>−3</td></tr></table>	Ⓐ	Ⓑ
	Ⓐ	Ⓑ

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12 Indicate whether each statement is an example of association, causation, both association and causation, or neither association nor causation.

Select **ONE** correct answer in each row.

Statement	Association	Causation	Both	Neither
When the speed of a car decreases, the arrival time to a destination is later.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
When the temperature increases, the sale of snow cones increases.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
When the oven temperature increases, the cooking time for a casserole decreases.	Ⓐ	Ⓑ	Ⓒ	Ⓓ

13 What are the domain and range of the function $f(x) = 3(x + 9)^2 - 8$?

Select **TWO** correct answers.

- ◯ Domain: $x \geq -9$
- ◯ Domain: $y \geq -8$
- ◯ Domain: all real numbers
- ◯ Range: $x \geq -9$
- ◯ Range: $y \geq -8$
- ◯ Range: all real numbers

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14 The functions $f(x) = x$ and $g(x) = \frac{3}{4}f(x + 4)$ are graphed on the same coordinate grid. Which statements are true?

Select **THREE** correct answers.

- ◯ The graph of f is steeper than the graph of g.
- ◯ The graph of g is steeper than the graph of f.
- ◯ To create g, f is translated 4 units to the left.
- ◯ To create g, f is translated 4 units to the right.
- ◯ The x-intercept of g is 4 units to the left of the x-intercept of f.
- ◯ The x-intercept of g is 4 units to the right of the x-intercept of f.

STAAR
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