Level 4: Expressions and Equations Midtest Answer Key

Question 1:

On a coordinate plane, the graph of line *p* passes through the origin and has a slope of −2.

Write the equation of line *p*.

$y = -2x$

Question 2:

Line *p* goes through the origin and contains the point (–5, –3).

Which equation represents line *p*?

a. $y = \frac{3}{5}x$

b. $y = \frac{5}{3}x$

c. $y = 5x - 3$

d. $y = -5x - 3$

Question 3:

A line passes though the points (2, 4) and (5, 10).

Write the equation of the line.

$y = 2x$

Question 4:

Line *n* contains the point (0, 3) and has a slope of −2.

Write the equation of line *n*.

$y = -2x + 3$

Continue

Question 5:

Nick's job as a computer salesperson pays $200 each week, plus $11 for each computer that he sells.

a. Write an equation that expresses the relationship between x, the number of computers Nick sells in a week, and y, the number of dollars he is paid for that week.

$$y = 11x + 200$$

b. How many dollars does Nick receive in a week in which he sells 64 computers?

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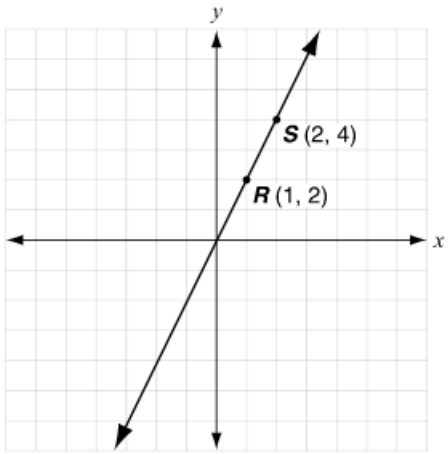
Question 6:

This graph shows line RS passes through the origin.



a. Write the equation of line RS.

$$y = 2x$$

b. The point $(x, -12.5)$ is on line RS.

Find the value of x.

x = -6.25

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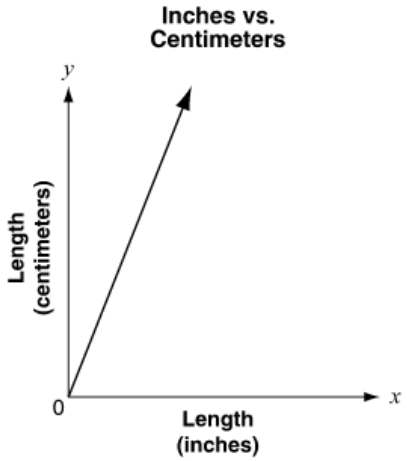
Question 7:

This graph shows how lengths in inches, x, are related to the equivalent length in centimeters, y.



The slope of the line in the graph is 2.54.

Which equation describes the relationship between x and y?

a. $x = y + 2.54$

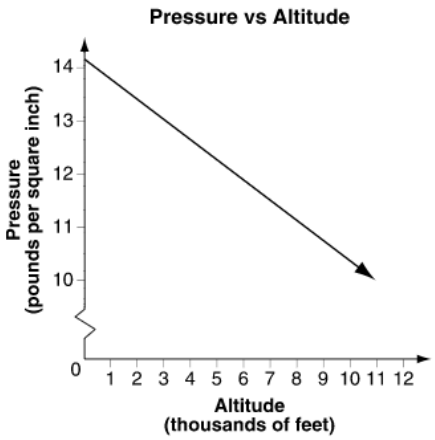
b. $y = x + 2.54$

c. $x = 2.54y$

d. $y = 2.54x$

Question 8:

This graph shows how air pressure depends on altitude.



What does the slope of the line in the graph represent?

a. the air pressure at an altitude of 0 feet

b. the average altitude at which there is air pressure

c. the decrease in air pressure as altitude increases

d. the range of altitudes for which air pressure can be calculated

Continue

Question 9:

The value of Andy's motorcycle was $6,000 in the year he bought it. Since then, its value has decreased at a rate of $250 per year.

Which equation describes the relationship between t, the number of years since he bought it, and V, the value in dollars of the motorcycle?

a. $V = -250 + 6{,}000t$

b. $V = -250 - 6{,}000t$

c. $V = -250t + 6{,}000$

d. $V = -250t - 6{,}000$

Question 10:

This table shows how the temperature inside a freezer changed over time after the freezer was unplugged.

Temperature in Unplugged Freezer

Time (hours)	Temperature (°C)
0	–15
2	–11
4	–7
6	–3
8	1
10	5

Which equation describes the relationship between t, the number of hours after the freezer was unplugged, and y, the temperature inside the freezer in degrees Celsius?

a. $y = -4t - 15$

b. $y = -2t - 15$

c. $y = 2t - 15$

d. $y = 4t - 15$

Continue

Question 11:

Terry is running on a treadmill. This table shows how the number of calories she burns depends on the amount of time she runs.

Running on a Treadmill

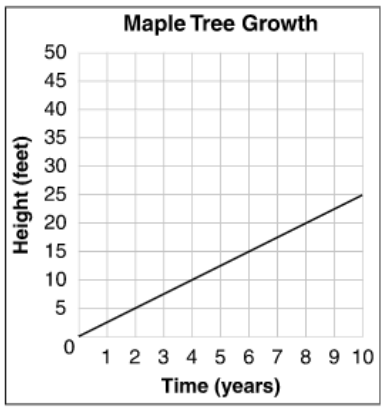
Time (minutes)	Number of Calories
5	30
10	60
15	90
20	120
25	150
30	180

Write an equation that shows the relationship between m, the number of minutes Terry runs, and c, the number of calories she burns.

$$c = 6m$$

Question 12:

The graph below shows how the height of a maple tree is changing over time.



The height of a pine tree is changing according to the equation $y = 3x$, where x represents time in years and y represents height in feet.

Which statement best compares the growth rates for the maple tree and the pine tree?

a. The maple tree is growing faster than the pine tree.

b. The pine tree is growing faster than the maple tree.

c. The maple tree and pine tree are growing at the same rate.

d. The pine tree grows faster at first, and then the maple tree grows faster.

Continue

Question 13:

Leonel is traveling to Mexico. He exchanged some U.S. dollars for Mexican pesos at a rate of 1 dollar for 14 pesos.

Which equation shows the relationship between the number of dollars, D, and number of pesos, P?

a. $D = 14P$

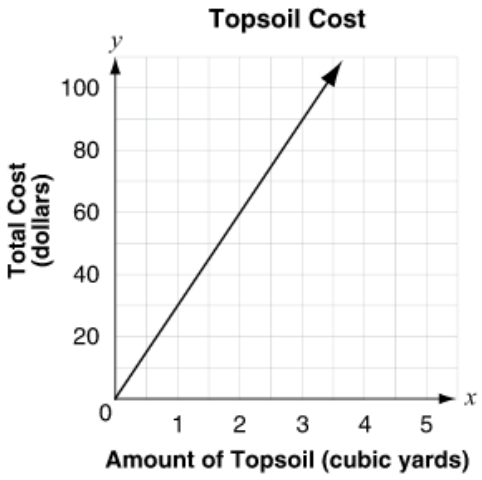
b. $D = \frac{P}{14}$

c. $D = 14 + P$

d. $D = 14 - P$

Question 14:

This graph shows the relationship between the number of cubic yards and total cost of topsoil at a garden shop.



The equation $y = 20x$ represents the cost, y, in dollars, of x cubic yards of mulch at the garden shop.

Which statement is true of the costs of topsoil and mulch?

a. Topsoil costs half as much as mulch.

b. Mulch costs the same amount as topsoil.

c. Mulch costs $10 more per cubic yard than topsoil.

d. Topsoil costs $10 more per cubic yard than mulch.

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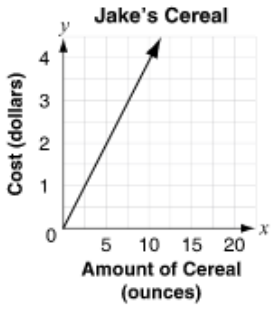
Question 15:

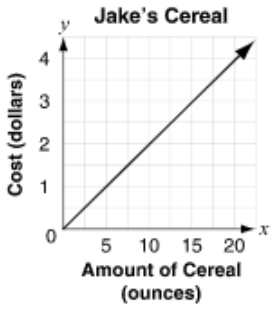
Randy's favorite cereal costs $0.20 per ounce. Jake's favorite cereal costs less than Randy's cereal.

Which graph could represent the cost per ounce of Jake's favorite cereal?

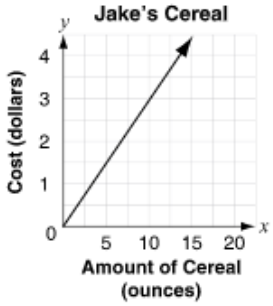
a.



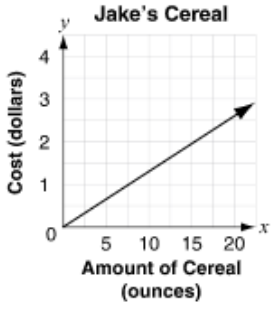
b.



c.



d.



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Question 16:

Kim and Leslie both graphed the relationship between the distance they walked, *y*, and the time they walked, *x*.

- Kim walked $1\frac{1}{4}$ miles in $\frac{1}{2}$ hour.
- Leslie walked 1 mile in $\frac{1}{3}$ hour.

Which statement is true about their graphs?

a. The slope of Kim's graph is steeper than the slope of Leslie's graph.

b. The slope of Leslie's graph is steeper than the slope of Kim's graph.

c. The slopes of both Kim's graph and Leslie's graph are vertical lines.

d. The slopes of both Kim's graph and Leslie's graph are horizontal lines.

Question 17:

This table shows the cost of bagels at a grocery store.

Grocery Store Bagels

Number of Bagels	Total Cost ($)
3	2.5
6	5
12	10

A bakery sells 10 bagels for $7.50. Each bagel at the bakery costs the same amount.

Which statement is true?

a. The grocery store charges more for 1 bagel than the bakery.

b. The grocery store charges less for 10 bagels than the bakery.

c. The grocery store charges the same amount for 1 bagel as the bakery.

d. The grocery store charges the same amount for 10 bagels as the bakery.

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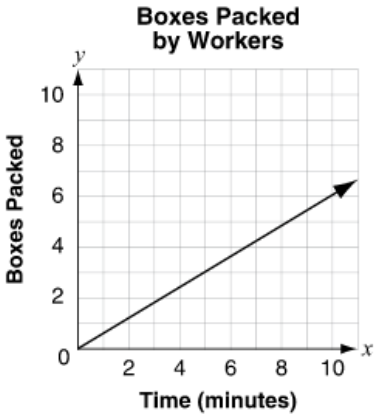
Question 18:

This graph shows the relationship between the time workers spend packing boxes and the number boxes they pack.



Which statement is true?

a. Each minute 3 boxes are packed.

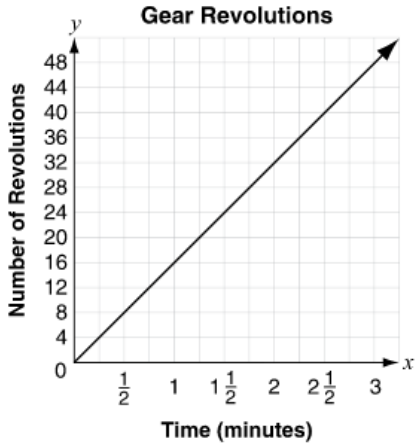
b. Each minute 5 boxes are packed.

c. It takes 3 minutes to pack 5 boxes.

d. It takes 5 minutes to pack 3 boxes.

Question 19:

This graph shows the relationship between the number of revolutions a gear makes and the time in minutes.



What is the unit rate of this relationship?

a. 1 revolution per minute

b. 4 revolutions per minute

c. 8 revolutions per minute

d. 16 revolutions per minute

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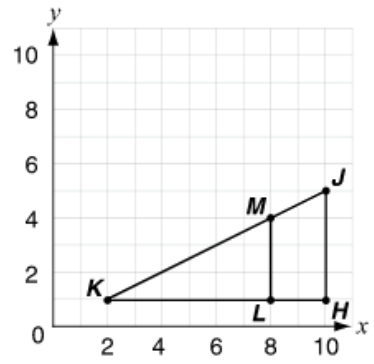
Question 20:

Points K, M, and J lie on the same line.



Which statement can be used to explain why the slope of $\overline{KM}$ is the same as the slope of $\overline{KJ}$?

a. $\overline{KM}$ and $\overline{KJ}$ are parallel.

b. $\overline{KM}$ and $\overline{KJ}$ share point K.

c. Triangle HJK is similar to triangle LMK.

d. Triangle HJK and triangle LMK are acute.

Question 21:

Triangle RST is similar to triangle QSU.

Which equation explains why the slopes of $\overline{ST}$ and $\overline{SU}$ are the same?

a. $\frac{0-6}{9-7} = \frac{0-9}{9-6}$

b. $\frac{9-7}{0-6} = \frac{9-6}{0-9}$

c. $\frac{0-6}{0-4} = \frac{9-7}{9-3}$

d. $\frac{0-4}{0-6} = \frac{9-3}{9-7}$

Stop