



Test #8

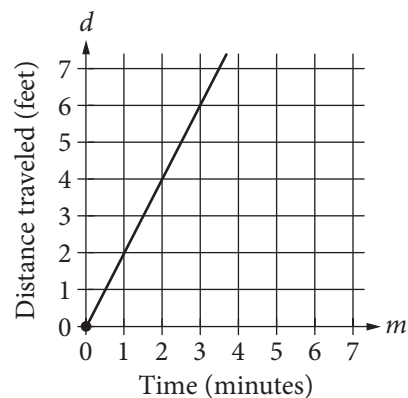
1

$$3x + x + x + x - 3 - 2 = 7 + x + x$$

In the equation above, what is the value of x ?

- A) $-\frac{5}{7}$
- B) 1
- C) $\frac{12}{7}$
- D) 3

2



The graph above shows the distance traveled d , in feet, by a product on a conveyor belt m minutes after the product is placed on the belt. Which of the following equations correctly relates d and m ?

- A) $d = 2m$
- B) $d = \frac{1}{2}m$
- C) $d = m + 2$
- D) $d = 2m + 2$



3

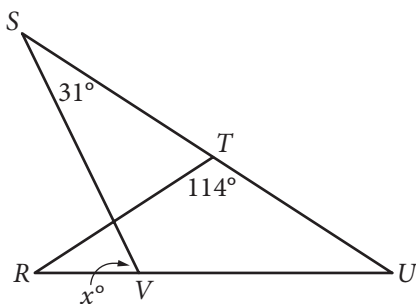
The formula below is often used by project managers to compute E , the estimated time to complete a job, where O is the shortest completion time, P is the longest completion time, and M is the most likely completion time.

$$E = \frac{O + 4M + P}{6}$$

Which of the following correctly gives P in terms of E , O , and M ?

- A) $P = 6E - O - 4M$
- B) $P = -6E + O + 4M$
- C) $P = \frac{O + 4M + E}{6}$
- D) $P = \frac{O + 4M - E}{6}$

4



In the figure above, $RT = TU$. What is the value of x ?

- A) 72
- B) 66
- C) 64
- D) 58

5

The width of a rectangular dance floor is w feet. The length of the floor is 6 feet longer than its width. Which of the following expresses the perimeter, in feet, of the dance floor in terms of w ?

- A) $2w + 6$
- B) $4w + 12$
- C) $w^2 + 6$
- D) $w^2 + 6w$

6

$$y > 2x - 1$$

$$2x > 5$$

Which of the following consists of the y -coordinates of all the points that satisfy the system of inequalities above?

- A) $y > 6$
- B) $y > 4$
- C) $y > \frac{5}{2}$
- D) $y > \frac{3}{2}$



7

$$\sqrt{2x+6} + 4 = x + 3$$

What is the solution set of the equation above?

- A) $\{-1\}$
- B) $\{5\}$
- C) $\{-1, 5\}$
- D) $\{0, -1, 5\}$

8

$$f(x) = x^3 - 9x$$

$$g(x) = x^2 - 2x - 3$$

Which of the following expressions is equivalent to

$$\frac{f(x)}{g(x)}, \text{ for } x > 3 ?$$

- A) $\frac{1}{x+1}$
- B) $\frac{x+3}{x+1}$
- C) $\frac{x(x-3)}{x+1}$
- D) $\frac{x(x+3)}{x+1}$

9

$$(x-6)^2 + (y+5)^2 = 16$$

In the xy -plane, the graph of the equation above is a circle. Point P is on the circle and has coordinates $(10, -5)$. If \overline{PQ} is a diameter of the circle, what are the coordinates of point Q ?

- A) $(2, -5)$
- B) $(6, -1)$
- C) $(6, -5)$
- D) $(6, -9)$

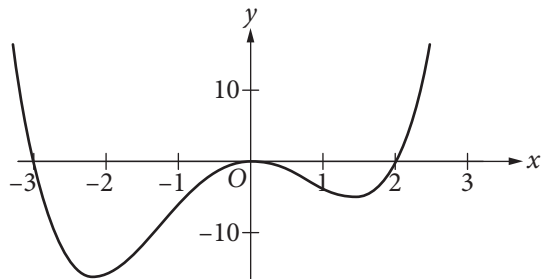
10

A group of 202 people went on an overnight camping trip, taking 60 tents with them. Some of the tents held 2 people each, and the rest held 4 people each. Assuming all the tents were filled to capacity and every person got to sleep in a tent, exactly how many of the tents were 2-person tents?

- A) 30
- B) 20
- C) 19
- D) 18



11



Which of the following could be the equation of the graph above?

- A) $y = x(x - 2)(x + 3)$
- B) $y = x^2(x - 2)(x + 3)$
- C) $y = x(x + 2)(x - 3)$
- D) $y = x^2(x + 2)(x - 3)$

12

If $\frac{2a}{b} = \frac{1}{2}$, what is the value of $\frac{b}{a}$?

- A) $\frac{1}{8}$
- B) $\frac{1}{4}$
- C) 2
- D) 4

13

Oil and gas production in a certain area dropped from 4 million barrels in 2000 to 1.9 million barrels in 2013. Assuming that the oil and gas production decreased at a constant rate, which of the following linear functions f best models the production, in millions of barrels, t years after the year 2000?

- A) $f(t) = \frac{21}{130}t + 4$
- B) $f(t) = \frac{19}{130}t + 4$
- C) $f(t) = -\frac{21}{130}t + 4$
- D) $f(t) = -\frac{19}{130}t + 4$



14

$$y = x^2 + 3x - 7$$
$$y - 5x + 8 = 0$$

How many solutions are there to the system of equations above?

- A) There are exactly 4 solutions.
- B) There are exactly 2 solutions.
- C) There is exactly 1 solution.
- D) There are no solutions.

15

$$g(x) = 2x - 1$$
$$h(x) = 1 - g(x)$$

The functions g and h are defined above. What is the value of $h(0)$?

- A) -2
- B) 0
- C) 1
- D) 2



16

$$x^2 + x - 12 = 0$$

If a is a solution of the equation above and $a > 0$, what is the value of a ?

17

The sum of $-2x^2 + x + 31$ and $3x^2 + 7x - 8$ can be written in the form $ax^2 + bx + c$, where a , b , and c are constants. What is the value of $a + b + c$?

18

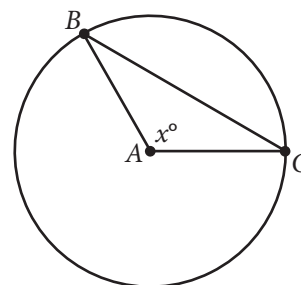
$$\begin{aligned} -x + y &= -3.5 \\ x + 3y &= 9.5 \end{aligned}$$

If (x, y) satisfies the system of equations above, what is the value of y ?

19

A start-up company opened with 8 employees. The company's growth plan assumes that 2 new employees will be hired each quarter (every 3 months) for the first 5 years. If an equation is written in the form $y = ax + b$ to represent the number of employees, y , employed by the company x quarters after the company opened, what is the value of b ?

20



Note: Figure not drawn to scale.

In the circle above, point A is the center and the length of arc \widehat{BC} is $\frac{2}{5}$ of the circumference of the circle. What is the value of x ?

STOP

**If you finish before time is called, you may check your work on this section only.
Do not turn to any other section.**