

Math

27 QUESTIONS

DIRECTIONS

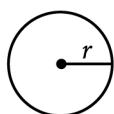
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

Unless otherwise indicated:

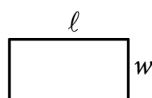
- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE

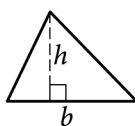


$$A = \pi r^2$$

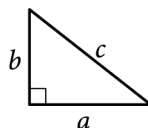
$$C = 2\pi r$$



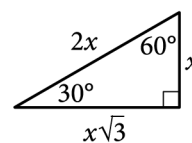
$$A = \ell w$$



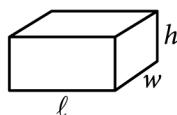
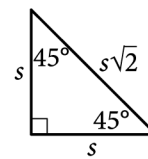
$$A = \frac{1}{2}bh$$



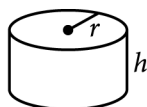
$$c^2 = a^2 + b^2$$



Special Right Triangles



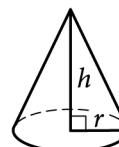
$$V = \ell wh$$



$$V = \pi r^2 h$$



$$V = \frac{4}{3}\pi r^3$$



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



$$V = \frac{1}{3}\ell wh$$

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is 2π .

The sum of the measures in degrees of the angles of a triangle is 180.

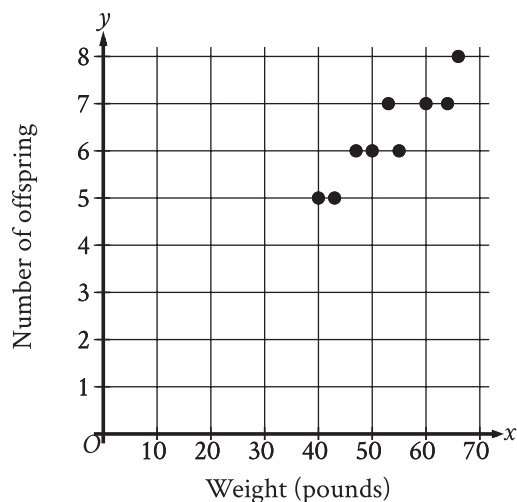
For multiple-choice questions, solve each problem, choose the correct answer from the choices provided, and then circle your answer in this book. Circle only one answer for each question. If you change your mind, completely erase the circle. You will not get credit for questions with more than one answer circled, or for questions with no answers circled.

For student-produced response questions, solve each problem and write your answer next to or under the question in the test book as described below.

- Once you've written your answer, circle it clearly. You will not receive credit for anything written outside the circle, or for any questions with more than one circled answer.
- If you find **more than one correct answer**, write and circle only one answer.
- Your answer can be up to 5 characters for a **positive** answer and up to 6 characters (including the negative sign) for a **negative** answer, but no more.
- If your answer is a **fraction** that is too long (over 5 characters for positive, 6 characters for negative), write the decimal equivalent.
- If your answer is a **decimal** that is too long (over 5 characters for positive, 6 characters for negative), truncate it or round at the fourth digit.
- If your answer is a **mixed number** (such as $3\frac{1}{2}$), write it as an improper fraction ($\frac{7}{2}$) or its decimal equivalent (3.5).
- Don't include **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

1

The scatterplot shows the relationship between the weight, in pounds, of each of 9 female gray wolves on April 30 and the number of offspring each gray wolf produced.



How many offspring did the 50-pound gray wolf produce?

- A) 8
- B) 7
- C) 6
- D) 5

2

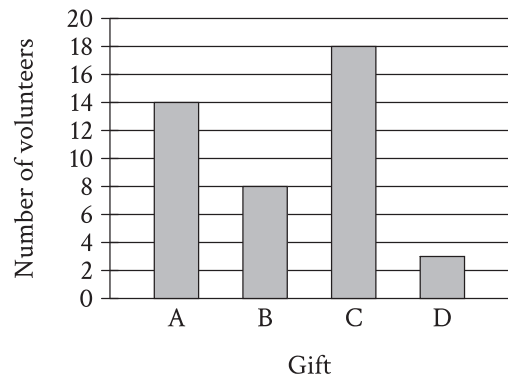
$$y = 4$$

$$x = y + 6$$

The solution to the given system of equations is (x, y) . What is the value of x ?

- A) 10
- B) 6
- C) 4
- D) 2

3



In April, there were 43 volunteers in a cleanup project. Each volunteer was asked to choose a small gift labeled A, B, C, or D. The bar graph shows the number of volunteers who chose each gift. How many volunteers chose gift C?

- A) 3
- B) 8
- C) 14
- D) 18

4

−13, 4, 23

A data set of three numbers is shown. If a number from this data set is selected at random, what is the probability of selecting a negative number?

- A) 0
- B) $\frac{1}{3}$
- C) $\frac{2}{3}$
- D) 1

5

A line in the xy -plane has a slope of $-\frac{1}{2}$ and passes through the point $(0, 3)$. Which equation represents this line?

- A) $y = -\frac{1}{2}x - 3$
- B) $y = -\frac{1}{2}x + 3$
- C) $y = \frac{1}{2}x - 3$
- D) $y = \frac{1}{2}x + 3$

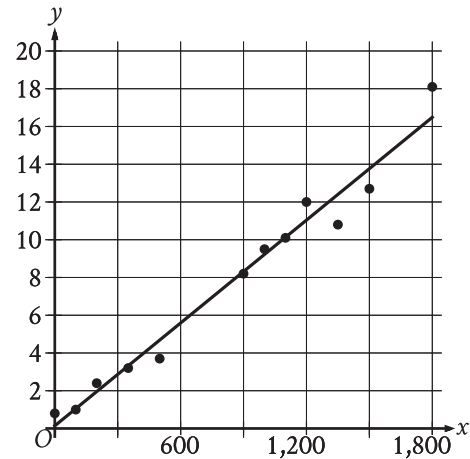
6

A product costs 11.00 dollars per pound. What is the cost, in dollars, for 6 pounds of the product?

7

The equation $46 = 2x + 2y$ gives the perimeter of a rectangular rug that has length x , in feet, and width y , in feet. The width of the rug is 8 feet. What is the length, in feet, of the rug?

8



Twelve data points are shown in the scatterplot. A line of best fit for the data is also shown. At $x = 1,200$, which of the following is closest to the y -value predicted by the line of best fit?

- A) 16
- B) 14
- C) 11
- D) 6

9

Which expression is equivalent to $(8yz)(y)(7z)$?

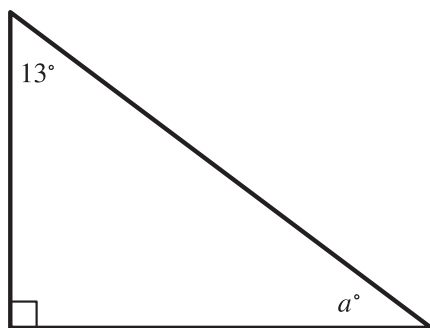
- A) $56y^2z^2$
- B) $56y^2z$
- C) $56yz$
- D) $16yz$

10

A food truck buys forks for \$0.04 each and plates for \$0.48 each. The total cost of x forks and y plates is \$661.76. Which equation represents this situation?

- A) $0.48x - 0.04y = 661.76$
- B) $0.04x - 0.48y = 661.76$
- C) $0.48x + 0.04y = 661.76$
- D) $0.04x + 0.48y = 661.76$

11



Note: Figure not drawn to scale.

In the right triangle shown, what is the value of a ?

- A) 13
- B) 77
- C) 90
- D) 103

12

Gabriella deposits \$35 in a savings account at the end of each week. At the beginning of the 1st week of a year there was \$600 in that savings account. How much money, in dollars, will be in the account at the end of the 4th week of that year?

- A) 460
- B) 635
- C) 639
- D) 740

13

$$x^2 = (22)(22)$$

What is the positive solution to the given equation?

14

The ratio 140 to m is equivalent to the ratio 4 to 28. What is the value of m ?

15

If $3x - 27 = 24$, what is the value of $x - 9$?

- A) 1
- B) 8
- C) 24
- D) 35

16

For the linear function f , $f(0) = 17$ and $f(1) = 17$. Which equation defines f ?

- A) $f(x) = \frac{1}{17}$
- B) $f(x) = 1$
- C) $f(x) = 17$
- D) $f(x) = 34$

17

The function $f(x) = 55.20 - 0.16x$ gives the estimated surface water temperature $f(x)$, in degrees Celsius, of a body of water on the x th day of the year, where $220 \leq x \leq 360$. Based on the model, what is the estimated surface water temperature, in degrees Celsius, of this body of water on the 326th day of the year?

- A) 55.20
- B) 3.04
- C) -0.16
- D) -52.16

18

$$y = -\frac{1}{5}x$$
$$y = \frac{1}{7}x$$

The solution to the given system of equations is (x, y) . What is the value of x ?

- A) -5
- B) 0
- C) 2
- D) 7

19

A sample of a certain isotope takes 29 years to decay to half its original mass. The function $s(t) = 184(0.5)^{\frac{t}{29}}$ gives the approximate mass of this isotope, in grams, that remains t years after a 184-gram sample starts to decay. Which statement is the best interpretation of $s(87) = 23$ in this context?

- A) Approximately 23 grams of the sample remains 87 years after the sample starts to decay.
- B) The mass of the sample has decreased by approximately 23 grams 87 years after the sample starts to decay.
- C) The mass of the sample has decreased by approximately 87 grams 23 years after the sample starts to decay.
- D) Approximately 87 grams of the sample remains 23 years after the sample starts to decay.

20

How many fluid ounces are equivalent to 76 quarts?
(8 fluid ounces = 1 cup and 4 cups = 1 quart)

21

A piece of wire with a length of 32 inches is cut into two parts. One part has a length of x inches, and the other part has a length of y inches. The value of x is 4 more than 3 times the value of y . What is the value of x ?

22

The table gives the perimeters of similar triangles TUV and XYZ , where $\overline{TU}$ corresponds to $\overline{XY}$. The length of $\overline{TU}$ is 18.

	Perimeter
Triangle TUV	37
Triangle XYZ	333

What is the length of $\overline{XY}$?

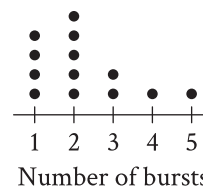
- A) 2
- B) 18
- C) 55
- D) 162

23

A sphere has a radius of $\frac{17}{5}$ feet. What is the volume, in cubic feet, of the sphere?

- A) $\frac{5\pi}{17}$
- B) $\frac{68\pi}{15}$
- C) $\frac{32\pi}{5}$
- D) $\frac{19,652\pi}{375}$

24



The dot plot represents a data set of the number of bursts for 13 eruptions of a steam vent. If an additional eruption with 11 bursts is added to this data set to create a new data set of 14 eruptions, which of the following measures will be greater for the new data set than for the original data set?

- I. The median number of bursts
 - II. The mean number of bursts
- A) I and II
 - B) I only
 - C) II only
 - D) Neither I nor II

25

A factory makes 9-inch, 7-inch, and 4-inch concrete screws. During a certain day, the number of 9-inch concrete screws that the factory makes is 5 times the number n of 7-inch concrete screws, and the number of 4-inch concrete screws is 22. During this day, the factory makes 100 concrete screws total. Which equation represents this situation?

- A) $9(5n) + 7n + 4(22) = 100$
- B) $9n + 7n + 4n = 100$
- C) $5n + 22 = 100$
- D) $6n + 22 = 100$

26

The number a is 190% greater than the number b . The number b is 80% less than 24. What is the value of a ?

- A) 9.12
- B) 13.92
- C) 26.40
- D) 36.48

27

A right square prism has a height of 14 units. The volume of the prism is 2,016 cubic units. What is the length, in units, of an edge of the base?

STOP

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

No Test Material On This Page