

Math

22 QUESTIONS | 35 MINUTES

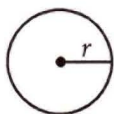
DIRECTIONS

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

NOTES

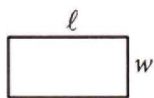
Unless otherwise indicated: • All variables and expressions represent real numbers. • Figures provided are drawn to scale. • All figures lie in a plane. • The domain of a given function is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE

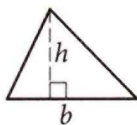


$$A = \pi r^2$$

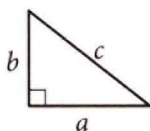
$$C = 2\pi r$$



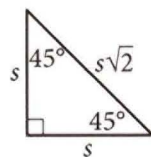
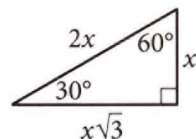
$$A = \ell w$$



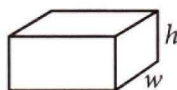
$$A = \frac{1}{2}bh$$



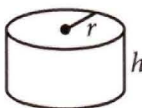
$$c^2 = a^2 + b^2$$



Special Right Triangles



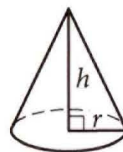
$$V = \ell wh$$



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



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



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



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

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

Which of the following equations is equal to

$$3(x + 5)^2 - 2(x - 5)^2 + 2x?$$

- A) $x^2 + x + 125$
- B) $3x^2 + 52x + 25$
- C) $x^2 - 2x - 25$
- D) $x^2 + 52x + 25$

2

Which of the following is equivalent to

$$\frac{1}{x-2} + \frac{2x}{5-x}, \text{ for all values of } x, \text{ where } x \neq 2 \text{ and } x \neq 5?$$

- A) $\frac{2x^2 - 5x + 5}{-x^2 + 7x - 10}$
- B) $\frac{2x + 1}{-3}$
- C) $\frac{2x + 1}{3}$
- D) $\frac{2x + 1}{(5 - x)(x - 2)}$

3

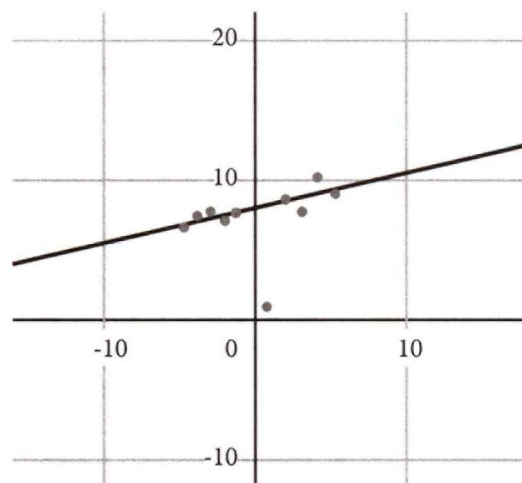
What is the value of y for the system below?

$$3(x - 2) + 5y = 2$$

$$y = -2(x - 5)$$

4

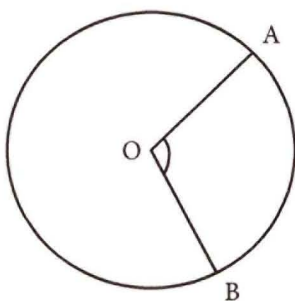
Which of the following best describes the line of best fit for the graph below?



- A) $y = \frac{1}{4}x + 8$
- B) $y = 4x + 8$
- C) $y = \frac{1}{4}x - 8$
- D) $y = \frac{-1}{4}x + 8$

5

If angle AOB is $\frac{7}{12}\pi$, what is the value of the arc length AB, given that the radius of the circle is 6 cm?



- A) 12π cm
- B) 36π cm
- C) $\frac{7}{2}\pi$ cm
- D) $\frac{21}{2}\pi$ cm

6

What is the sum of the roots for the equation given below

$$2x^2 + 6x + 4 = 0?$$

- A) -3
- B) -2
- C) 2
- D) 3

7

If the difference of the sum of the interior angles in a hexagon and that of a heptagon is $a\pi$, what is the value of a ?

8

Given that $f(3) = 2$ and $f(6) = -3$, which of the following functions best describes $f(x)$?

- A) $f(x) = -\frac{5}{3}x + 7$
- B) $f(x) = \frac{2}{3}x - 6$
- C) $f(x) = -\frac{3}{5}x$
- D) $f(x) = \frac{3}{5}x + 2$

9

Given that $2(x + 4) = 18$, what is the value of $x + 6$?

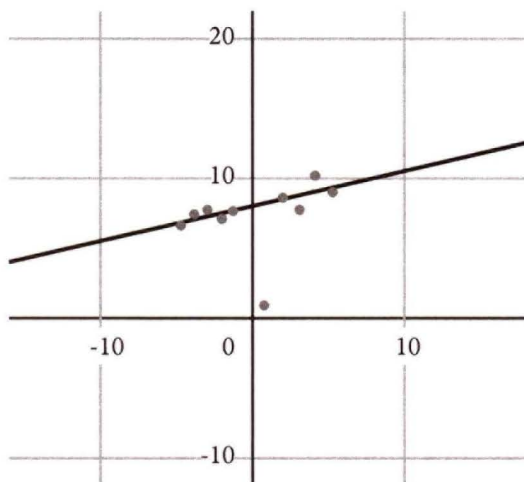
- A) 9
- B) 5
- C) -4
- D) 11

10

An educational fair is attended by students and parents in a state. If 2,000 students attended the fair, and the ratio of students to parents in the fair is 5:3.5, how many people attended the fair?

11

Find the percent decrease from the actual value y for when $x = 4$ and the predicted value y for when $x = 4$.



- A) 22.22%
- B) 33.33%
- C) 50%
- D) 18.18%

12

Which of the following coordinates represent a solution to the following system of inequalities

$$y > -3x + 5$$

$$y > 2x?$$

- A) (2, 4)
- B) (1, 4)
- C) (4, 3)
- D) (2, 1)

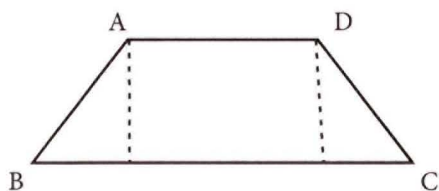
13

What is one possible positive solution to the equation below?

$$3|x - 4| = 6$$

14

If $AB = DC$ and segment AD is parallel to segment BC , and $AD = 12$, $DC = 10$, and $BC = 28$, find the area of the figure $ABCD$ below (not drawn to scale).



- A) 120
- B) 60
- C) 96
- D) 48

15

How many solutions does the equation below have

$$2|x+3| - 3|x+3| = -2?$$

- A) 0
- B) 1
- C) 2
- D) There isn't sufficient information to answer the question.

16

What is the value of the slope of a line perpendicular to the line $5x - 6y + 30 = 0$

17

Which of the following is equivalent to $\cos 72^\circ$?

- A) $\tan 18^\circ$
- B) $\sin 72^\circ$
- C) $\sin 18^\circ$
- D) $\cos 18^\circ$

18

The weather channel predicted that there will be a 0.26 chance that it will rain this week. What is the probability that it will not rain this week?

- A) 0.62
- B) 0.74
- C) 0.26
- D) 1

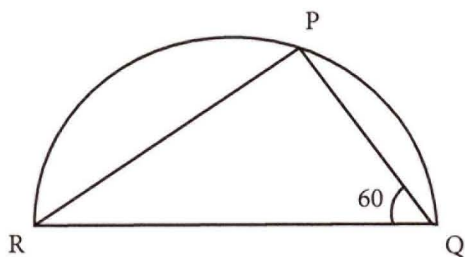
19

What is the maximum value of t for the given equation $v(t)$?

$$v(t) = -3t^2 + 9t + 12$$

20

If the semi-circle below has a radius of 7 and angle $PQR = 60^\circ$, what is the length of side PR ?



- A) 14
- B) 7
- C) $7\sqrt{2}$
- D) $7\sqrt{3}$

21

Which of the following is a solution to the inequality $|x + 3| > 4$?

- A) -5
- B) -9
- C) -2
- D) -7

22

If $3x + 4y = 31$ and $2x + 3y = 22$, what is the value of $x + y$?

- A) 9
- B) 5
- C) 4
- D) 11

STOP