

Math

27 QUESTIONS

DIRECTIONS

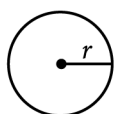
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

Unless otherwise indicated:

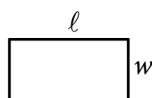
- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE

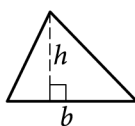


$$A = \pi r^2$$

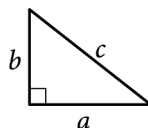
$$C = 2\pi r$$



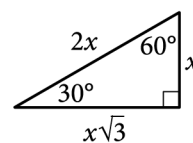
$$A = \ell w$$



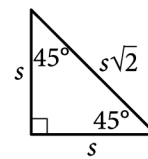
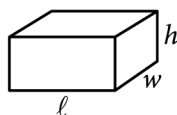
$$A = \frac{1}{2}bh$$



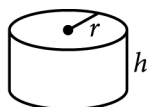
$$c^2 = a^2 + b^2$$



Special Right Triangles



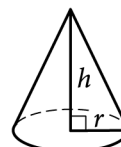
$$V = \ell wh$$



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



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



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



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

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

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

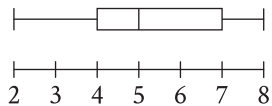
The sum of the measures in degrees of the angles of a triangle is 180.

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.

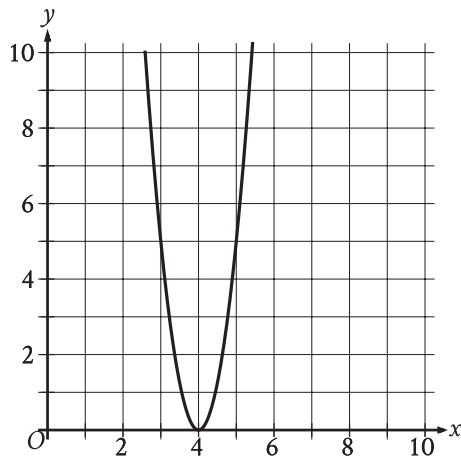
1



The box plot summarizes 15 data values. What is the median of this data set?

- A) 2
- B) 3
- C) 5
- D) 8

2



What is the x -intercept of the graph shown?

- A) $(-5, 0)$
- B) $(5, 0)$
- C) $(-4, 0)$
- D) $(4, 0)$

3

Henry receives a \$60.00 gift card to pay for movies online. He uses his gift card to buy 3 movies for \$7.50 each. If he spends the rest of his gift card balance on renting movies for \$1.50 each, how many movies can Henry rent?

- A) 10
- B) 25
- C) 35
- D) 40

4

$$x = 49$$
$$y = \sqrt{x} + 9$$

The graphs of the given equations intersect at the point (x, y) in the xy -plane. What is the value of y ?

- A) 16
- B) 40
- C) 81
- D) 130

5

A cherry pitting machine pits 12 pounds of cherries in 3 minutes. At this rate, how many minutes does it take the machine to pit 96 pounds of cherries?

- A) 8
- B) 15
- C) 24
- D) 36

6

If $2x = 12$, what is the value of $9x$?

7

Line k is defined by $y = \frac{1}{4}x + 1$. Line j is parallel to line k in the xy -plane. What is the slope of j ?

8

6, 6, 8, 8, 8, 10, 21

Which of the following lists represents a data set that has the same median as the data set shown?

- A) 4, 6, 6, 6, 8, 8
- B) 6, 6, 8, 8, 10, 10
- C) 6, 8, 10, 10, 10, 12
- D) 8, 8, 10, 10, 21, 21

9

The length of the base of a certain parallelogram is 89% of the height of the parallelogram. Which expression represents the length of the base of the parallelogram, where h is the height of the parallelogram?

- A) $89h$
- B) $0.089h$
- C) $8.9h$
- D) $0.89h$

10

For a camping trip a group bought x one-liter bottles of water and y three-liter bottles of water, for a total of 240 liters of water. Which equation represents this situation?

- A) $x + 3y = 240$
- B) $x + y = 240$
- C) $3x + 3y = 240$
- D) $3x + y = 240$

11

$$y = -4x + 40$$

Which table gives three values of x and their corresponding values of y for the given equation?

A)

x	y
0	0
1	-4
2	-8

B)

x	y
0	40
1	44
2	48

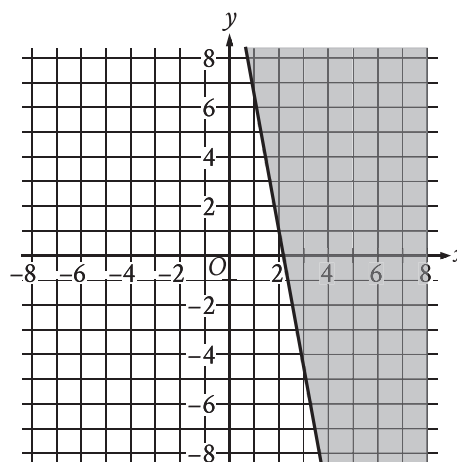
C)

x	y
0	40
1	36
2	32

D)

x	y
0	0
1	4
2	8

12



The shaded region shown represents solutions to an inequality. Which ordered pair (x, y) is a solution to this inequality?

- A) $(0, -4)$
- B) $(0, 4)$
- C) $(-4, 0)$
- D) $(4, 0)$

13

In triangle JKL , the measures of $\angle K$ and $\angle L$ are each 48° . What is the measure of $\angle J$, in degrees? (Disregard the degree symbol when entering your answer.)

14

$$\begin{aligned}y &= x^2 + 14x + 48 \\x + 8 &= 11\end{aligned}$$

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

15

A cleaning service that cleans both offices and homes can clean at most 14 places per day. Which inequality represents this situation, where f is the number of offices and h is the number of homes?

- A) $f + h \leq 14$
- B) $f + h \geq 14$
- C) $f - h \leq 14$
- D) $f - h \geq 14$

16

Which expression is a factor of $2x^2 + 38x + 10$?

- A) 2
- B) $5x$
- C) $38x$
- D) $2x^2$

17

The equation $40x + 20y = 160$ represents the number of sweaters, x , and number of shirts, y , that Yesenia purchased for \$160. If Yesenia purchased 2 sweaters, how many shirts did she purchase?

- A) 3
- B) 4
- C) 8
- D) 40

18

$$y = 0.25x^2 - 7.5x + 90.25$$

The equation gives the estimated stock price y , in dollars, for a certain company x days after a new product launched, where $0 \leq x \leq 20$. Which statement is the best interpretation of $(x, y) = (1, 83)$ in this context?

- A) The company's estimated stock price increased \$83 every day after the new product launched.
- B) The company's estimated stock price increased \$1 every 83 days after the new product launched.
- C) 1 day after the new product launched, the company's estimated stock price is \$83.
- D) 83 days after the new product launched, the company's estimated stock price is \$1.

19

$$f(x) = 39$$

For the given linear function f , which table gives three values of x and their corresponding values of $f(x)$?

A)

x	$f(x)$
0	0
1	0
2	0

B)

x	$f(x)$
0	39
1	39
2	39

C)

x	$f(x)$
0	0
1	39
2	78

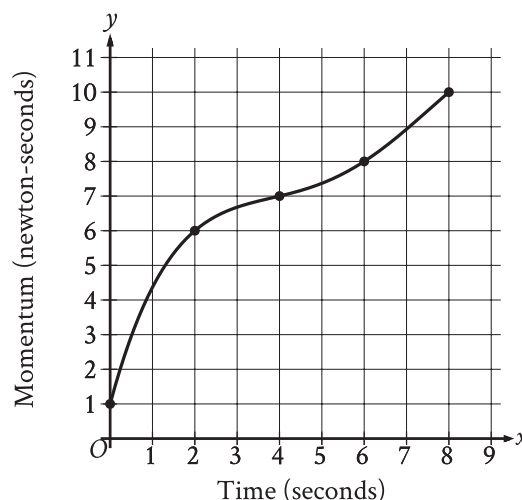
D)

x	$f(x)$
0	39
1	0
2	-39

20

A triangular prism has a height of 8 centimeters (cm) and a volume of 216 cm^3 . What is the area, in cm^2 , of the base of the prism? (The volume of a triangular prism is equal to Bh , where B is the area of the base and h is the height of the prism.)

21



The graph shows the momentum y , in newton-seconds, of an object x seconds after the object started moving, for $0 \leq x \leq 8$. What is the average rate of change, in newton-seconds per second, in the momentum of the object from $x = 2$ to $x = 6$?

22

$$-15x + 25y = 65$$

One of the two equations in a system of linear equations is given. The system has infinitely many solutions. Which of the following could be the second equation in the system?

- A) $12x + 20y = 52$
- B) $12x + 20y = -52$
- C) $-12x + 20y = 52$
- D) $-12x + 20y = -52$

23

A bus traveled on the highway and on local roads to complete a trip of 160 miles. The trip took 4 hours. The bus traveled at an average speed of 55 miles per hour (mph) on the highway and an average speed of 25 mph on local roads. If x is the time, in hours, the bus traveled on the highway and y is the time, in hours, it traveled on local roads, which system of equations represents this situation?

- A) $55x + 25y = 4$
 $x + y = 160$
- B) $55x + 25y = 160$
 $x + y = 4$
- C) $25x + 55y = 4$
 $x + y = 160$
- D) $25x + 55y = 160$
 $x + y = 4$

24

Quadrilateral $P'Q'R'S'$ is similar to quadrilateral $PQRS$, where P , Q , R , and S correspond to P' , Q' , R' , and S' , respectively. The measure of angle P is 30° , the measure of angle Q is 50° , and the measure of angle R is 70° . The length of each side of $P'Q'R'S'$ is 3 times the length of each corresponding side of $PQRS$. What is the measure of angle P' ?

- A) 10°
- B) 30°
- C) 40°
- D) 90°

25

$$f(x) = 2x + 244$$

The given function f represents the perimeter, in centimeters (cm), of a rectangle with a length of x cm and a fixed width. What is the width, in cm, of the rectangle?

- A) 2
- B) 122
- C) 244
- D) 488

26

The functions f and g are defined by the given equations, where $x \geq 0$. Which of the following equations displays, as a constant or coefficient, the maximum value of the function it defines, where $x \geq 0$?

I. $f(x) = 33(0.4)^{x+3}$

II. $g(x) = 33(0.16)(0.4)^{x-2}$

- A) I only
- B) II only
- C) I and II
- D) Neither I nor II

27

$$64x^2 - (16a + 4b)x + ab = 0$$

In the given equation, a and b are positive constants. The sum of the solutions to the given equation is $k(4a + b)$, where k is a constant. What is the value of k ?

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