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Practice Test #6

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Math

27 QUESTIONS

DIRECTIONS

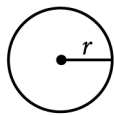
The questions in this section address a number of important math skills. Use of a calculator is permitted for all questions.

NOTES

Unless otherwise indicated:

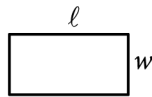
- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

REFERENCE

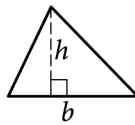


$$A = \pi r^2$$

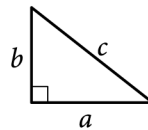
$$C = 2\pi r$$



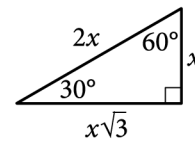
$$A = \ell w$$



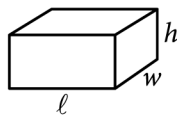
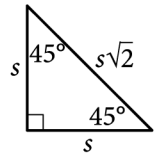
$$A = \frac{1}{2}bh$$



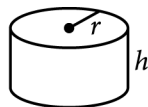
$$c^2 = a^2 + b^2$$



Special Right Triangles



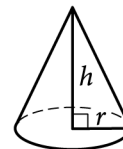
$$V = \ell wh$$



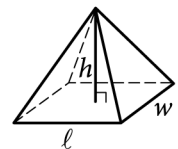
$$V = \pi r^2 h$$



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



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



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

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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.

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- Don't include **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

1

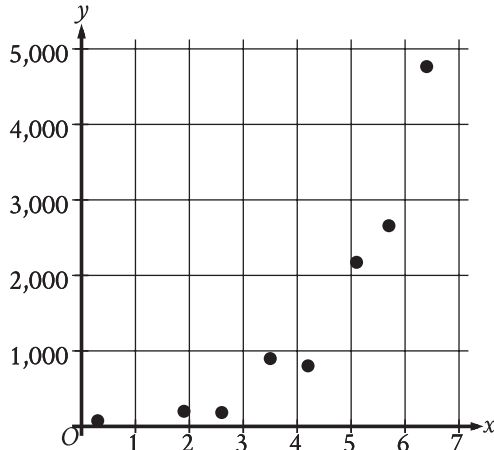
$$(p + 3) + 8 = 10$$

What value of p is the solution to the given equation?

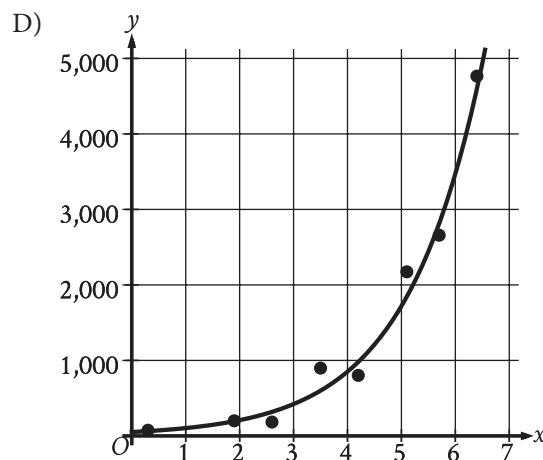
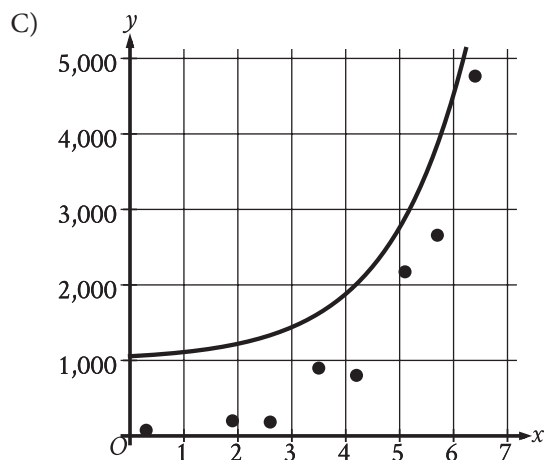
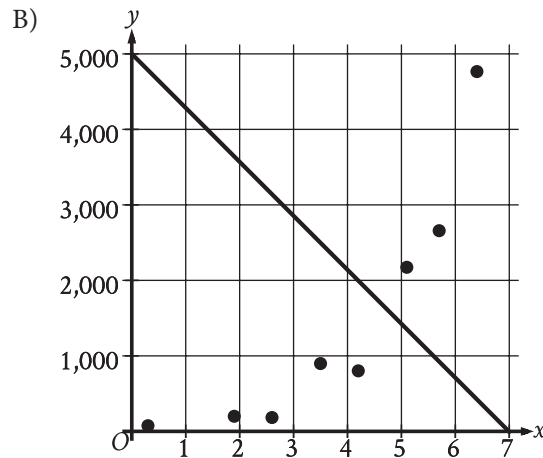
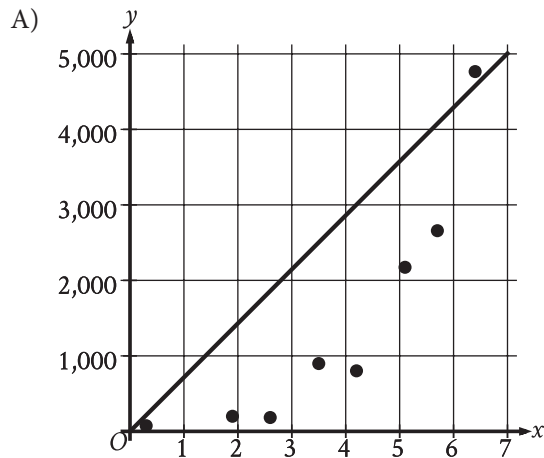
- A) -1
- B) 5
- C) 15
- D) 21

2

The scatterplot shows the relationship between two variables, x and y .



Which of the following graphs shows the most appropriate model for the data?



3

$$k^2 - 53 = 91$$

What is the positive solution to the given equation?

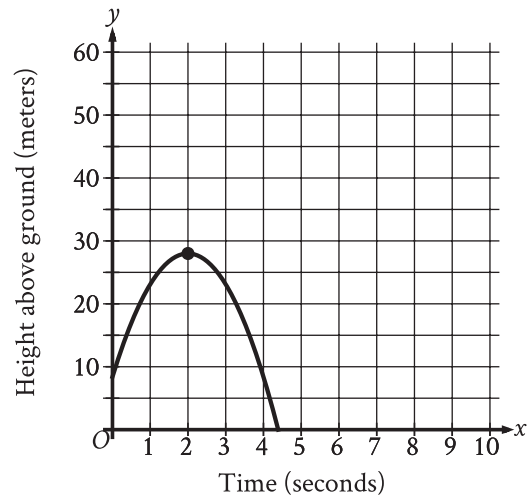
- A) 144
- B) 72
- C) 38
- D) 12

4

During a portion of a flight, a small airplane's cruising speed varied between 150 miles per hour and 170 miles per hour. Which inequality best represents this situation, where s is the cruising speed, in miles per hour, during this portion of the flight?

- A) $s \leq 20$
- B) $s \leq 150$
- C) $s \leq 170$
- D) $150 \leq s \leq 170$

5



An object was launched upward from a platform. The graph shown models the height above ground, y , in meters, of the object x seconds after it was launched. For which of the following intervals of time was the height of the object increasing for the entire interval?

- A) From $x = 0$ to $x = 2$
- B) From $x = 0$ to $x = 4$
- C) From $x = 2$ to $x = 3$
- D) From $x = 3$ to $x = 4$

6

How many yards are equivalent to 1,116 inches?
(1 yard = 36 inches)

7

$$f(x) = 14 + 4x$$

The function f represents the total cost, in dollars, of attending an arcade when x games are played. How many games can be played for a total cost of \$58?

8

$$f(x) = x + b$$

For the linear function f , b is a constant. When $x = 0$, $f(x) = 30$. What is the value of b ?

- A) -30
- B) $-\frac{1}{30}$
- C) $\frac{1}{30}$
- D) 30

9

$$P(t) = 1,800(1.02)^t$$

The function P gives the estimated number of marine mammals in a certain area, where t is the number of years since a study began. What is the best interpretation of $P(0) = 1,800$ in this context?

- A) The estimated number of marine mammals in the area was 102 when the study began.
- B) The estimated number of marine mammals in the area was 1,800 when the study began.
- C) The estimated number of marine mammals in the area increased by 102 each year during the study.
- D) The estimated number of marine mammals in the area increased by 1,800 each year during the study.

10

A manager is responsible for ordering supplies for a shaved ice shop. The shop's inventory starts with 4,500 paper cups, and the manager estimates that 70 of these paper cups are used each day. Based on this estimate, in how many days will the supply of paper cups reach 1,700?

- A) 20
- B) 40
- C) 60
- D) 80

11

$$y > 4x + 8$$

For which of the following tables are all the values of x and their corresponding values of y solutions to the given inequality?

A)

x	y
2	19
4	30
6	41

B)

x	y
2	8
4	16
6	24

C)

x	y
2	13
4	18
6	23

D)

x	y
2	13
4	21
6	29

12

Which expression is equivalent to

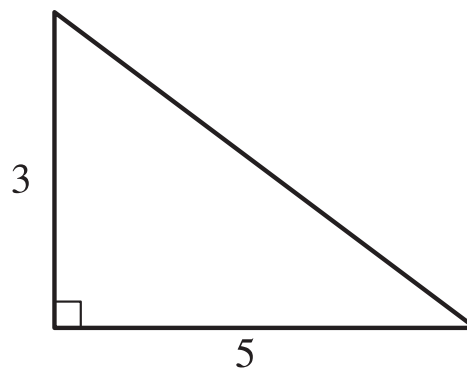
$$(x^2 + 11)^2 + (x - 5)(x + 5) ?$$

- A) $x^4 + 23x^2 - 14$
 B) $x^4 + 23x^2 + 96$
 C) $x^4 + 12x^2 + 121$
 D) $x^4 + x^2 + 146$

13

The function h is defined by $h(x) = \frac{8}{5x + 6}$. What is the value of $h(2)$?

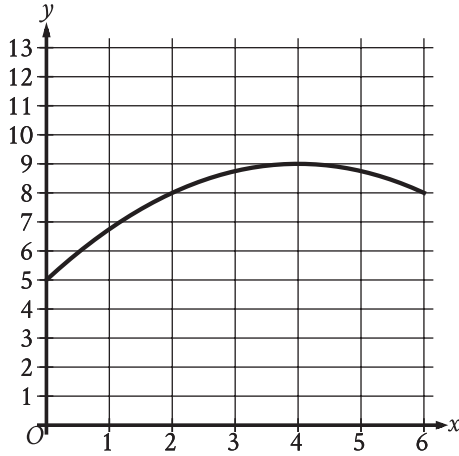
14



Note: Figure not drawn to scale.

The figure shows the lengths, in inches, of two sides of a right triangle. What is the area of the triangle, in square inches?

15



The graph models the number of active projects a company was working on x months after the end of November 2012, where $0 \leq x \leq 6$. According to the model, what is the predicted number of active projects the company was working on at the end of November 2012?

- A) 0
- B) 5
- C) 8
- D) 9

16

The relationship between two variables, x and y , is linear. For every increase in the value of x by 1, the value of y increases by 8. When the value of x is 2, the value of y is 18. Which equation represents this relationship?

- A) $y = 2x + 18$
- B) $y = 2x + 8$
- C) $y = 8x + 2$
- D) $y = 3x + 26$

17

$$P = N(19 - C)$$

The given equation relates the positive numbers P , N , and C . Which equation correctly expresses C in terms of P and N ?

- A) $C = \frac{19 + P}{N}$
- B) $C = \frac{19 - P}{N}$
- C) $C = 19 + \frac{P}{N}$
- D) $C = 19 - \frac{P}{N}$

18

$$w^2 + 12w - 40 = 0$$

Which of the following is a solution to the given equation?

- A) $6 - 2\sqrt{19}$
- B) $2\sqrt{19}$
- C) $\sqrt{19}$
- D) $-6 + 2\sqrt{19}$

19

The table shown summarizes the number of employees at each of the 17 restaurants in a town.

Number of employees	Number of restaurants
2 to 7	2
8 to 13	4
14 to 19	2
20 to 25	7
26 to 31	2

Which of the following could be the median number of employees for the restaurants in this town?

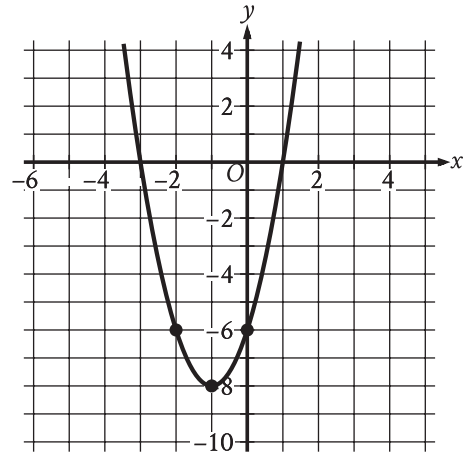
- A) 2
- B) 9
- C) 15
- D) 21

20

What is the y -coordinate of the y -intercept of the

graph of $\frac{3x}{7} = -\frac{5y}{9} + 21$ in the xy -plane?

21



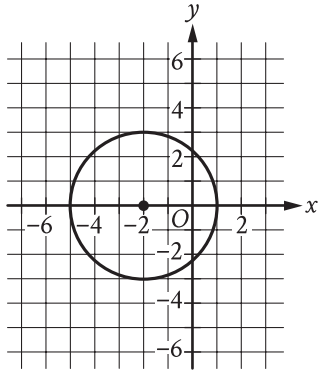
The graph of $y = 2x^2 + bx + c$ is shown, where b and c are constants. What is the value of bc ?

22

In 2008, Zinah earned 14% more than in 2007, and in 2009 Zinah earned 4% more than in 2008. If Zinah earned y times as much in 2009 as in 2007, what is the value of y ?

- A) 0.5600
- B) 1.0056
- C) 1.1800
- D) 1.1856

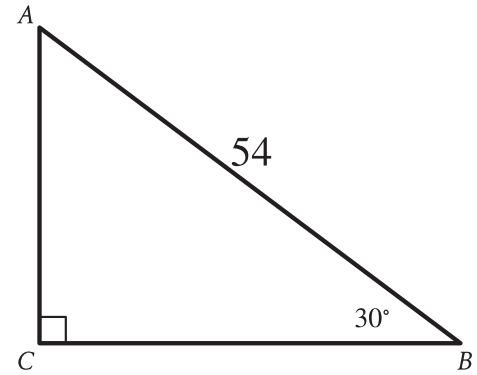
23



Circle A (shown) is defined by the equation $(x + 2)^2 + y^2 = 9$. Circle B (not shown) is the result of shifting circle A down 6 units and increasing the radius so that the radius of circle B is 2 times the radius of circle A . Which equation defines circle B ?

- A) $(x + 2)^2 + (y + 6)^2 = (4)(9)$
- B) $2(x + 2)^2 + 2(y + 6)^2 = 9$
- C) $(x + 2)^2 + (y - 6)^2 = (4)(9)$
- D) $2(x + 2)^2 + 2(y - 6)^2 = 9$

24



Note: Figure not drawn to scale.

Right triangle ABC is shown. What is the value of $\tan A$?

- A) $\frac{\sqrt{3}}{54}$
- B) $\frac{1}{\sqrt{3}}$
- C) $\sqrt{3}$
- D) $27\sqrt{3}$

25

At the time that an article was first featured on the home page of a news website, there were 40 comments on the article. An exponential model estimates that at the end of each hour after the article was first featured on the home page, the number of comments on the article had increased by 190% of the number of comments on the article at the end of the previous hour. Which of the following equations best represents this model, where C is the estimated number of comments on the article t hours after the article was first featured on the home page and $t \leq 4$?

- A) $C = 40(1.19)^t$
- B) $C = 40(1.9)^t$
- C) $C = 40(19)^t$
- D) $C = 40(2.9)^t$

26

x	$g(x)$
-27	3
-9	0
21	5

The table shows three values of x and their corresponding values of $g(x)$, where $g(x) = \frac{f(x)}{x+3}$ and f is a linear function. What is the y -intercept of the graph of $y = f(x)$ in the xy -plane?

- A) (0, 36)
- B) (0, 12)
- C) (0, 4)
- D) (0, -9)

27

In right triangle ABC , angle C is the right angle and $BC = 162$. Point D on side AB is connected by a line segment with point E on side AC such that line segment DE is parallel to side BC and $CE = 2AE$. What is the length of line segment DE ?

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

Math

27 QUESTIONS

DIRECTIONS

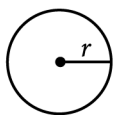
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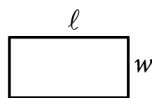
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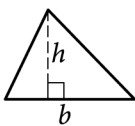


$$A = \pi r^2$$

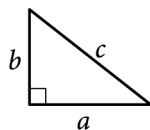
$$C = 2\pi r$$



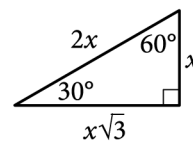
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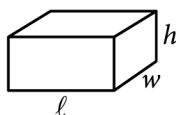
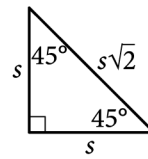
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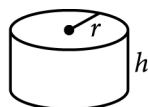
$$c^2 = a^2 + b^2$$



Special Right Triangles



$$V = \ell wh$$



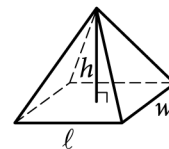
$$V = \pi r^2 h$$



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



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



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

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

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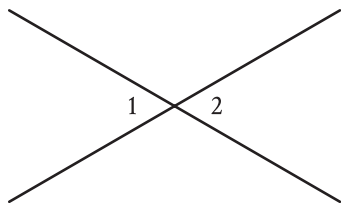
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1

The function f is defined by $f(x) = 8x$. For what value of x does $f(x) = 72$?

- A) 8
- B) 9
- C) 64
- D) 80

2



Note: Figure not drawn to scale.

In the figure, two lines intersect at a point. Angle 1 and angle 2 are vertical angles. The measure of angle 1 is 72° . What is the measure of angle 2?

- A) 72°
- B) 108°
- C) 144°
- D) 288°

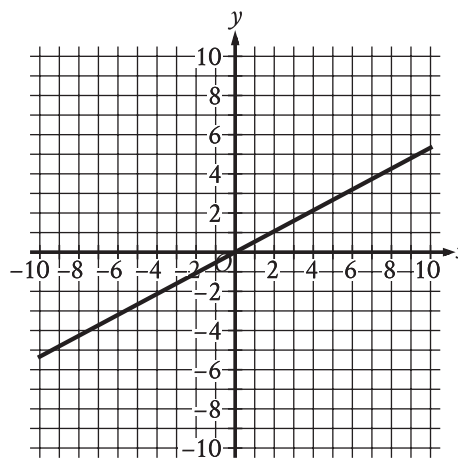
3

On a street with 7 houses, 2 houses are blue. If a house from this street is selected at random, what is the probability of selecting a house that is blue?

- A) $\frac{1}{7}$
- B) $\frac{2}{7}$
- C) $\frac{5}{7}$
- D) $\frac{7}{7}$

4

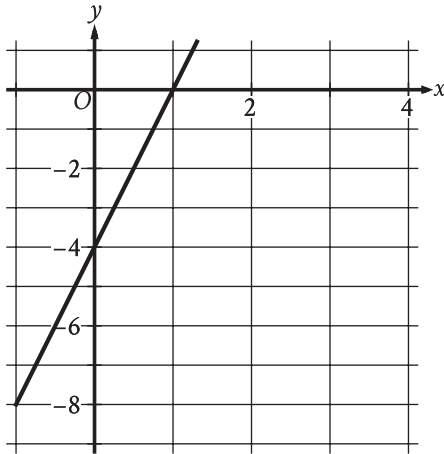
The graph of function f is shown, where $y = f(x)$.



Which of the following describes function f ?

- A) Increasing linear
- B) Decreasing linear
- C) Increasing exponential
- D) Decreasing exponential

5



The graph of the function f is shown, where $y = f(x)$. What is the y -intercept of the graph?

- A) $(0, -1)$
- B) $(0, -4)$
- C) $(0, 1)$
- D) $(0, 4)$

6

$$\begin{aligned}x &= 8 \\x + 3y &= 26\end{aligned}$$

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

7

The amount of Hanna's bill for a food order was \$50. Hanna gave a tip of 20% of the amount of the bill. What is the amount, in dollars, of the tip Hanna gave?

8

Which expression is equivalent to $5x^5 - 6x^4 + 8x^3$?

- A) $x^4(5x - 6)$
- B) $x^3(5x^2 - 6x + 8)$
- C) $8x^3(5x^2 - 6x + 1)$
- D) $6x^5(-6x^4 + 8x^3 + 1)$

9

The ratio of the length of line segment XY to the length of line segment ZV is 6 to 1. If the length of line segment XY is 102 inches, what is the length, in inches, of line segment ZV ?

- A) 17
- B) 96
- C) 102
- D) 612

10

$$7(2x - 3) = 63$$

Which equation has the same solution as the given equation?

- A) $2x - 3 = 9$
- B) $2x - 3 = 56$
- C) $2x - 21 = 63$
- D) $2x - 21 = 70$

11

The function f defined by $f(t) = 14t + 9$ gives the estimated length, in inches, of a vine plant t months after Tavon purchased it. Which of the following is the best interpretation of 9 in this context?

- A) Tavon will keep the vine plant for 9 months.
- B) The vine plant is expected to grow 9 inches each month.
- C) The vine plant is expected to grow to a maximum length of 9 inches.
- D) The estimated length of the vine plant was 9 inches when Tavon purchased it.

12

$$(x + 2)(x - 5)(x + 9) = 0$$

What is a positive solution to the given equation?

- A) 3
- B) 4
- C) 5
- D) 18

13

Brian saves $\frac{2}{5}$ of the \$215 he earns each week from his job. If Brian continues to save at this rate, how much money, in dollars, will Brian save in 9 weeks?

14

A rectangle has an area of 155 square inches. The length of the rectangle is 4 inches less than 7 times the width of the rectangle. What is the width of the rectangle, in inches?

15

4, 10, 18, 4, 4, 5, 6, 5

What is the median of the data set shown?

- A) 4
- B) 5
- C) 7
- D) 14

16

A right circular cylinder has a volume of 432 cubic centimeters. The area of the base of the cylinder is 24 square centimeters. What is the height, in centimeters, of the cylinder?

- A) 18
- B) 24
- C) 216
- D) 10,368

17

$$x^2 = -841$$

How many distinct real solutions does the given equation have?

- A) Exactly one
- B) Exactly two
- C) Infinitely many
- D) Zero

18

Line k is defined by $y = 7x + \frac{1}{8}$. Line j isperpendicular to line k in the xy -plane. What is the slope of line j ?

- A) -8
- B) $-\frac{1}{7}$
- C) $\frac{1}{8}$
- D) 7

19

Number of cars	Maximum number of passengers and crew
3	174
5	284
10	559

The table shows the linear relationship between the number of cars, c , on a commuter train and the maximum number of passengers and crew, p , that the train can carry. Which equation represents the linear relationship between c and p ?

- A) $55c - p = -9$
- B) $55c - p = 9$
- C) $55p - c = -9$
- D) $55p - c = 9$

20

If $4^{8c} = \sqrt[3]{4^7}$, what is the value of c ?

21

$$(x - 2) - 4(y + 7) = 117$$

$$(x - 2) + 4(y + 7) = 442$$

The solution to the given system of equations is (x, y) . What is the value of $6(x - 2)$?

22

In triangle ABC , angle B is a right angle. The length of side AB is $10\sqrt{37}$ and the length of side BC is $24\sqrt{37}$. What is the length of side AC ?

- A) $14\sqrt{37}$
- B) $26\sqrt{37}$
- C) $34\sqrt{37}$
- D) $\sqrt{34 \cdot 37}$

23

$$f(x) = (1.84)^{\frac{x}{4}}$$

The function f is defined by the given equation. The

equation can be rewritten as $f(x) = \left(1 + \frac{p}{100}\right)^x$,

where p is a constant. Which of the following is

closest to the value of p ?

- A) 16
- B) 21
- C) 46
- D) 96

24

The function f is defined by $f(x) = a\sqrt{x+b}$, where a and b are constants. In the xy -plane, the graph of $y = f(x)$ passes through the point $(-24, 0)$, and $f(24) < 0$. Which of the following must be true?

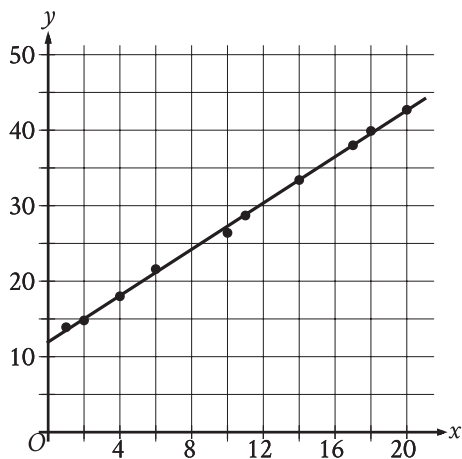
- A) $f(0) = 24$
- B) $f(0) = -24$
- C) $a > b$
- D) $a < b$

25

In the xy -plane, a circle has center C with coordinates (h, k) . Points A and B lie on the circle. Point A has coordinates $(h + 1, k + \sqrt{102})$, and $\angle ACB$ is a right angle. What is the length of \overline{AB} ?

- A) $\sqrt{206}$
- B) $2\sqrt{102}$
- C) $103\sqrt{2}$
- D) $103\sqrt{3}$

26



The scatterplot shows the relationship between two variables, x and y , for data set E. A line of best fit is shown. Data set F is created by multiplying the y -coordinate of each data point from data set E by 3.9. Which of the following could be an equation of a line of best fit for data set F?

- A) $y = 46.8 + 5.9x$
- B) $y = 46.8 + 1.5x$
- C) $y = 12 + 5.9x$
- D) $y = 12 + 1.5x$

27

$$48x - 64y = 48y + 24$$

$$ry = \frac{1}{8} - 12x$$

In the given system of equations, r is a constant. If the system has no solution, what is the value of r ?

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.

The SAT

GENERAL DIRECTIONS

- You may work on only one module at a time.
- If you finish a module before time is called, check your work on that module only. You may NOT turn to any other module.

TIMING

Reading and Writing, Module 1: 39 minutes

Reading and Writing, Module 2: 39 minutes

10-minute break

Math, Module 1: 43 minutes

Math, Module 2: 43 minutes

The above are standard times. If you are approved for accommodations involving additional time, you should give yourself that time when you practice.

MARKING YOUR ANSWERS

- Be sure to answer your questions properly in this book.
- Circle only one answer to 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.

USING YOUR TEST BOOK

- You may use the test book for scratch work.
- You may not fold or remove pages or portions of a page from this book, or take the book from the testing room.