WX5P0101

# The SAT®

# Practice Test #8

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SAT®

6WSL02

# 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:

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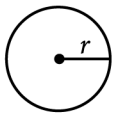
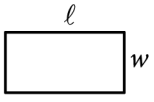
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function $f$ is the set of all real numbers $x$ for which $f(x)$ is a real number.

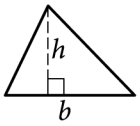
**REFERENCE**



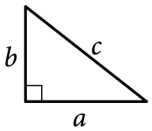

$A = \pi r^2$
$C = 2\pi r$



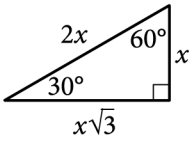

$A = \ell w$

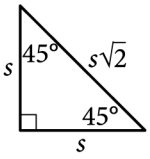



$A = \frac{1}{2}bh$

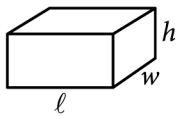



$c^2 = a^2 + b^2$

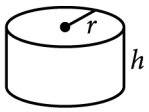



Special Right Triangles




$V = \ell wh$

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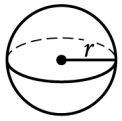
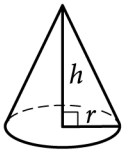
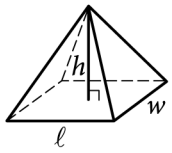



$V = \frac{4}{3}\pi r^3$




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




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

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

The number of radians of arc in a circle is $2\pi$.

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





CONTINUE

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- If your answer is a **mixed number** (such as $3\frac{1}{2}$), write it as an improper fraction (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.



CONTINUE

**1**

A bus is traveling at a constant speed along a straight portion of road. The equation $d = 30t$ gives the distance $d$, in feet from a road marker, that the bus will be $t$ seconds after passing the marker. How many feet from the marker will the bus be 2 seconds after passing the marker?

A) 30

B) 32

C) 60

D) 90

**2**

For a particular machine that produces beads, 29 out of every 100 beads it produces have a defect. A bead produced by the machine will be selected at random. What is the probability of selecting a bead that has a defect?

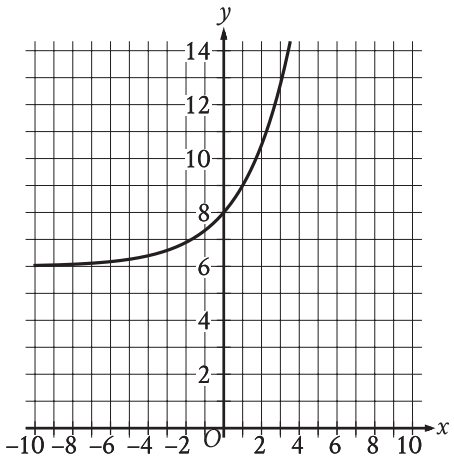
A) $\frac{1}{2{,}900}$

B) $\frac{1}{29}$

C) $\frac{29}{100}$

D) $\frac{29}{10}$

**3**




What is the $y$-intercept of the graph shown?

A) $(-8, 0)$

B) $(-6, 0)$

C) $(0, 6)$

D) $(0, 8)$

**4**

Which expression is equivalent to $(2x^2 + x - 9) + (x^2 + 6x + 1)$ ?

A) $2x^2 + 7x + 10$

B) $2x^2 + 6x - 8$

C) $3x^2 + 7x - 10$

D) $3x^2 + 7x - 8$





CONTINUE

5

An analyst collected data on the price of a carton of grape tomatoes at 30 locations selected at random in Utah. The mean price of a carton of grape tomatoes in Utah was estimated to be \$4.23, with an associated margin of error of \$0.08. Which of the following is a plausible statement about the mean price of a carton of grape tomatoes for all locations that sell this product in Utah?

A) It is between \$4.15 and \$4.31.

B) It is either less than \$4.15 or greater than \$4.31.

C) It is less than \$4.15.

D) It is greater than \$4.31.

6

$$2.6 + x = 2.8$$

What value of $x$ is the solution to the given equation?

7

Out of 300 seeds that were planted, 80% sprouted. How many of these seeds sprouted?

8

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

For the linear function $f$, $b$ is a constant and $f(7) = 28$. What is the value of $b$ ?

A) 0

B) 1

C) 4

D) 7

9

Right triangles $LMN$ and $PQR$ are similar, where $L$ and $M$ correspond to $P$ and $Q$, respectively. Angle $M$ has a measure of 53°. What is the measure of angle $Q$ ?

A) 37°

B) 53°

C) 127°

D) 143°

10

What is the equation of the line that passes through the point $(0, 5)$ and is parallel to the graph of $y = 7x + 4$ in the $xy$-plane?

A) $y = 5x$

B) $y = 7x + 5$

C) $y = 7x$

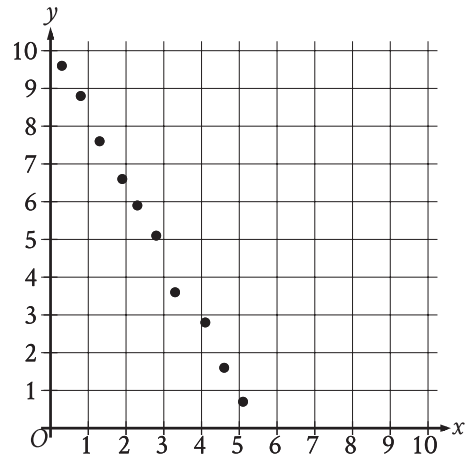
D) $y = 5x + 7$





CONTINUE

11




Which of the following equations is the most appropriate linear model for the data shown in the scatterplot?

A) $y = -1.9x - 10.1$

B) $y = -1.9x + 10.1$

C) $y = 1.9x - 10.1$

D) $y = 1.9x + 10.1$

12

A model predicts that the population of Bergen was 15,000 in 2005. The model also predicts that each year for the next 5 years, the population $p$ increased by 4% of the previous year's population. Which equation best represents this model, where $x$ is the number of years after 2005, for $x \leq 5$ ?

A) $p = 0.96(15{,}000)^x$

B) $p = 1.04(15{,}000)^x$

C) $p = 15{,}000(0.96)^x$

D) $p = 15{,}000(1.04)^x$

13

$$2a + 8b = 198$$
$$2a + 4b = 98$$

The solution to the given system of equations is $(a, b)$. What is the value of $b$ ?

14

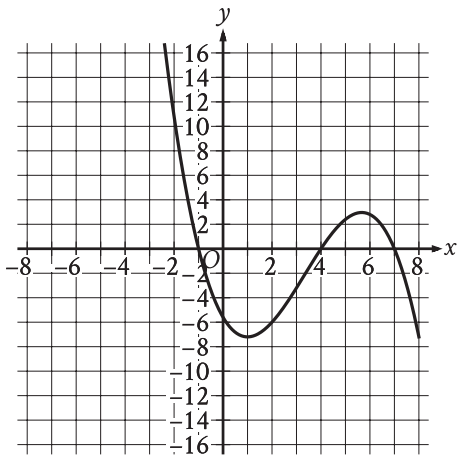
The expression $90y^5 - 54y^4$ is equivalent to $ry^4(15y - 9)$, where $r$ is a constant. What is the value of $r$ ?





CONTINUE

15




The graph of $y = f(x)$ is shown, where the function $f$ is defined by $f(x) = ax^3 + bx^2 + cx + d$ and $a$, $b$, $c$, and $d$ are constants. For how many values of $x$ does $f(x) = 0$ ?

A) One

B) Two

C) Three

D) Four

16

The area $A$, in square centimeters, of a rectangular cutting board can be represented by the expression $w(w + 9)$, where $w$ is the width, in centimeters, of the cutting board. Which expression represents the length, in centimeters, of the cutting board?

A) $w(w + 9)$

B) $w$

C) 9

D) $(w + 9)$

17

$$p = \frac{k}{4j + 9}$$

The given equation relates the distinct positive numbers $p$, $k$, and $j$. Which equation correctly expresses $4j + 9$ in terms of $p$ and $k$ ?

A) $4j + 9 = \frac{k}{p}$

B) $4j + 9 = kp$

C) $4j + 9 = k - p$

D) $4j + 9 = \frac{p}{k}$

18

Circle $A$ has a radius of $3n$ and circle $B$ has a radius of $129n$, where $n$ is a positive constant. The area of circle $B$ is how many times the area of circle $A$?

A) 43

B) 86

C) 129

D) 1,849





CONTINUE

19

The measure of angle $R$ is $\frac{2\pi}{3}$ radians. The measure of angle $T$ is $\frac{5\pi}{12}$ radians greater than the measure of angle $R$. What is the measure of angle $T$, in degrees?

A) 75

B) 120

C) 195

D) 390

20

$$y = x^2 - 14x + 22$$

The given equation relates the variables $x$ and $y$. For what value of $x$ does the value of $y$ reach its minimum?

21

A small business owner budgets $2,200 to purchase candles. The owner must purchase a minimum of 200 candles to maintain the discounted pricing. If the owner pays $4.90 per candle to purchase small candles and $11.60 per candle to purchase large candles, what is the maximum number of large candles the owner can purchase to stay within the budget and maintain the discounted pricing?

22

$$y \leq x + 7$$
$$y \geq -2x - 1$$

Which point $(x, y)$ is a solution to the given system of inequalities in the $xy$-plane?

A) $(-14, 0)$

B) $(0, -14)$

C) $(0, 14)$

D) $(14, 0)$





CONTINUE

23

| Weight (pounds) | Frequency |
|---|---|
| 13 | 12 |
| 14 | 8 |
| 15 | 5 |
| 16 | 7 |
| 17 | 9 |
| 18 | 10 |
| 19 | 13 |
| 20 | 7 |

The frequency table summarizes a data set of the weights, rounded to the nearest pound, of 71 tortoises. A weight of 39 pounds is added to the original data set, creating a new data set of the weights, rounded to the nearest pound, of 72 tortoises. Which statement best compares the mean and median of the new data set to the mean and median of the original data set?

A) The mean of the new data set is greater than the mean of the original data set, and the median of the new data set is greater than the median of the original data set.

B) The mean of the new data set is greater than the mean of the original data set, and the medians of the two data sets are equal.

C) The mean of the new data set is less than the mean of the original data set, and the median of the new data set is less than the median of the original data set.

D) The mean of the new data set is less than the mean of the original data set, and the medians of the two data sets are equal.

24

$$x - 29 = (x - a)(x - 29)$$

Which of the following are solutions to the given equation, where $a$ is a constant and $a > 30$ ?

I. $a$

II. $a + 1$

III. 29

A) I and II only

B) I and III only

C) II and III only

D) I, II, and III

25

In the $xy$-plane, the graph of the equation $y = -x^2 + 9x - 100$ intersects the line $y = c$ at exactly one point. What is the value of $c$?

A) $-\frac{481}{4}$

B) $-100$

C) $-\frac{319}{4}$

D) $-\frac{9}{2}$





CONTINUE

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. $f(x) = 18(1.25)^x + 41$

II. $g(x) = 9(0.73)^x$

A) I only

B) II only

C) I and II

D) Neither I nor II

27

The perimeter of an equilateral triangle is 852 centimeters. The three vertices of the triangle lie on a circle. The radius of the circle is $w\sqrt{3}$ centimeters. What is the value of $w$ ?

# 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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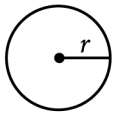


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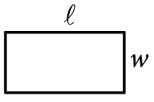


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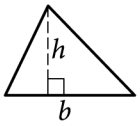


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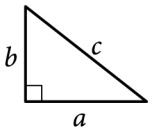


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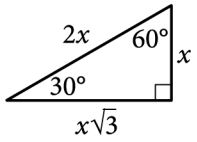
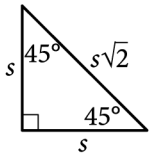
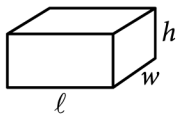
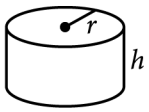



Special Right Triangles




$V = \ell wh$

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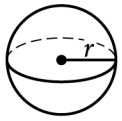


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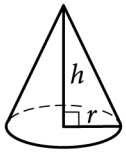
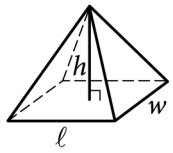



$V = \frac{1}{3}\pi r^2 h$




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

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

The number of radians of arc in a circle is $2\pi$.

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





CONTINUE

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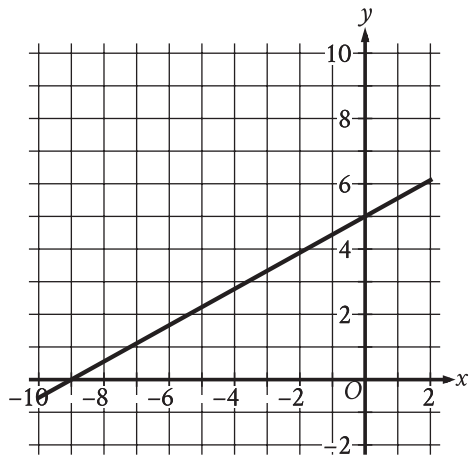
CONTINUE

1




What is the $y$-intercept of the line graphed?

A) $(-5, 0)$

B) $(0, 0)$

C) $(0, 5)$

D) $(0, 9)$

2

| Type of store | Average number of employees |
|---|---|
| Warehouse store | 365 |
| Department store | 213 |
| Supermarket | 130 |

For a certain region, the table shows the average number of store employees in 2016 by type of store. Based on the table, how much greater was the average number of store employees in warehouse stores than in supermarkets?

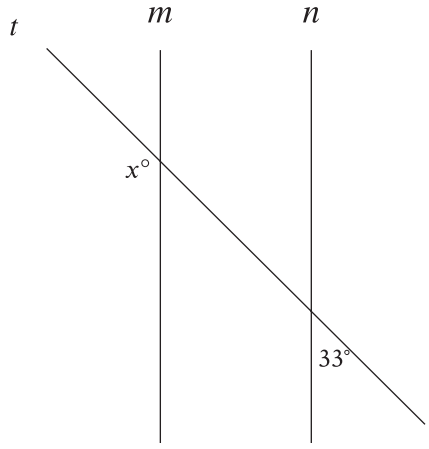
A) 83

B) 152

C) 235

D) 495

3




Note: Figure not drawn to scale.

In the figure, line $m$ is parallel to line $n$, and line $t$ intersects both lines. What is the value of $x$ ?

A) 33

B) 57

C) 123

D) 147

4

Sean rents a tent at a cost of \$11 per day plus a onetime insurance fee of \$10. Which equation represents the total cost $c$, in dollars, to rent the tent with insurance for $d$ days?

A) $c = 11(d + 10)$

B) $c = 10(d + 11)$

C) $c = 11d + 10$

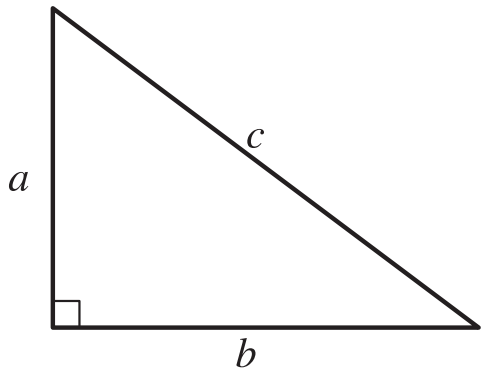
D) $c = 10d + 11$





CONTINUE

5




Note: Figure not drawn to scale.

For the right triangle shown, $a = 4$ and $b = 5$. Which expression represents the value of $c$ ?

A) $4 + 5$

B) $\sqrt{(4)(5)}$

C) $\sqrt{4 + 5}$

D) $\sqrt{4^2 + 5^2}$

6

The function $g$ is defined by $g(x) = 6x$. For what value of $x$ is $g(x) = 54$ ?

7

The function $f$ is defined by $f(x) = 8x^3 + 4$. What is the value of $f(2)$ ?

8

The function $f$ is defined by $f(x) = \frac{1}{10}x - 2$. What is the $y$-intercept of the graph of $y = f(x)$ in the $xy$-plane?

A) $(-2, 0)$

B) $(0, -2)$

C) $\left(0, \frac{1}{10}\right)$

D) $\left(\frac{1}{10}, 0\right)$

9

A producer is creating a video with a length of 70 minutes. The video will consist of segments that are 1 minute long and segments that are 3 minutes long. Which equation represents this situation, where $x$ represents the number of 1-minute segments and $y$ represents the number of 3-minute segments?

A) $4xy = 70$

B) $4(x + y) = 70$

C) $3x + y = 70$

D) $x + 3y = 70$





CONTINUE

**10**

The function $f$ is defined by $f(x) = 7x^3$. In the $xy$-plane, the graph of $y = g(x)$ is the result of shifting the graph of $y = f(x)$ down 2 units. Which equation defines function $g$ ?

A) $g(x) = \frac{7}{2}x^3$

B) $g(x) = 7x^{\frac{3}{2}}$

C) $g(x) = 7x^3 + 2$

D) $g(x) = 7x^3 - 2$

**11**

$$y = -3x$$
$$4x + y = 15$$

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

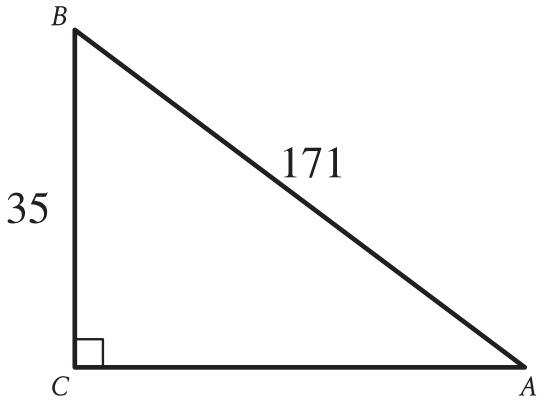
A) 1

B) 5

C) 15

D) 45

**12**




Note: Figure not drawn to scale.

In the right triangle shown, what is the value of $\sin A$ ?

A) $\frac{1}{171}$

B) $\frac{35}{171}$

C) $\frac{171}{35}$

D) 171

**13**

What is the area, in square centimeters, of a rectangle with a length of 34 centimeters (cm) and a width of 29 cm?





CONTINUE

14

If $\frac{x}{y} = 4$ and $\frac{24x}{ny} = 4$, what is the value of $n$ ?

15

A bowl contains 20 ounces of water. When the bowl is uncovered, the amount of water in the bowl decreases by 1 ounce every 4 days. If 9 ounces of water remain in this bowl, for how many days has it been uncovered?

A) 3

B) 7

C) 36

D) 44

16

If $9(4 - 3x) + 2 = 8(4 - 3x) + 18$, what is the value of $4 - 3x$ ?

A) $-16$

B) $-4$

C) 4

D) 16

17

A certain township consists of a 5-hectare industrial park and a 24-hectare neighborhood. The total number of trees in the township is 4,529. The equation $5x + 24y = 4{,}529$ represents this situation. Which of the following is the best interpretation of $x$ in this context?

A) The average number of trees per hectare in the industrial park

B) The average number of trees per hectare in the neighborhood

C) The total number of trees in the industrial park

D) The total number of trees in the neighborhood

18

Which expression is equivalent to $a^{\frac{11}{12}}$,

where $a > 0$ ?

A) $\sqrt[12]{a^{132}}$

B) $\sqrt[144]{a^{132}}$

C) $\sqrt[121]{a^{132}}$

D) $\sqrt[11]{a^{132}}$

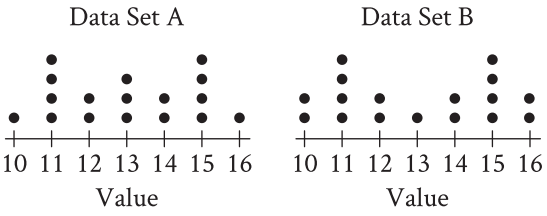




CONTINUE

19

The dot plots represent the distributions of values in data sets A and B.




Which of the following statements must be true?

I. The median of data set A is equal to the median of data set B.

II. The standard deviation of data set A is equal to the standard deviation of data set B.

A) I only

B) II only

C) I and II

D) Neither I nor II

20

A circle has center $O$, and points $R$ and $S$ lie on the circle. In triangle $ORS$, the measure of $\angle ROS$ is 88°. What is the measure of $\angle RSO$, in degrees? (Disregard the degree symbol when entering your answer.)

21

The regular price of a shirt at a store is \$11.70. The sale price of the shirt is 80% less than the regular price, and the sale price is 30% greater than the store's cost for the shirt. What was the store's cost, in dollars, for the shirt? (Disregard the \$ sign when entering your answer. For example, if your answer is \$4.97, enter 4.97)

22

A cube has an edge length of 68 inches. A solid sphere with a radius of 34 inches is inside the cube, such that the sphere touches the center of each face of the cube. To the nearest cubic inch, what is the volume of the space in the cube not taken up by the sphere?

A) 149,796

B) 164,500

C) 190,955

D) 310,800





CONTINUE

23

$y = 6x + 18$

One of the equations in a system of two linear equations is given. The system has no solution. Which equation could be the second equation in the system?

A) $-6x + y = 18$

B) $-6x + y = 22$

C) $-12x + y = 36$

D) $-12x + y = 18$

24

Triangles $PQR$ and $LMN$ are graphed in the $xy$-plane. Triangle $PQR$ has vertices $P$, $Q$, and $R$ at (4, 5), (4, 7), and (6, 5), respectively. Triangle $LMN$ has vertices $L$, $M$, and $N$ at (4, 5), (4, 7 + $k$), and (6 + $k$, 5), respectively, where $k$ is a positive constant. If the measure of $\angle Q$ is $t°$, what is the measure of $\angle N$ ?

A) $(90 - (t - k))°$

B) $(90 - (t + k))°$

C) $(90 - t)°$

D) $(90 + k)°$

25

$2x + 3y = 7$

$10x + 15y = 35$

For each real number $r$, which of the following points lies on the graph of each equation in the $xy$-plane for the given system?

A) $\left(\frac{r}{5} + 7, -\frac{r}{5} + 35\right)$

B) $\left(-\frac{3r}{2} + \frac{7}{2}, r\right)$

C) $\left(r, \frac{2r}{3} + \frac{7}{3}\right)$

D) $\left(r, -\frac{3r}{2} + \frac{7}{2}\right)$





CONTINUE

26

$$\frac{x^2}{\sqrt{x^2 - c^2}} = \frac{c^2}{\sqrt{x^2 - c^2}} + 39$$

In the given equation, $c$ is a positive constant. Which of the following is one of the solutions to the given equation?

A) $-c$

B) $-c^2 - 39^2$

C) $-\sqrt{39^2 - c^2}$

D) $-\sqrt{c^2 + 39^2}$

27

The quadratic function $g$ models the depth, in meters, below the surface of the water of a seal $t$ minutes after the seal entered the water during a dive. The function estimates that the seal reached its maximum depth of 302.4 meters 6 minutes after it entered the water and then reached the surface of the water 12 minutes after it entered the water. Based on the function, what was the estimated depth, to the nearest meter, of the seal 10 minutes after it entered the water?

# 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.