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Practice Test #10

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SAT®

6WSL04

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

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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.

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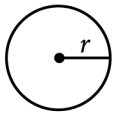
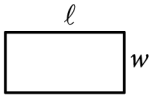
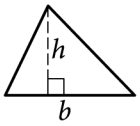


$A = \pi r^2$
$C = 2\pi r$



$A = \ell w$



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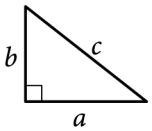

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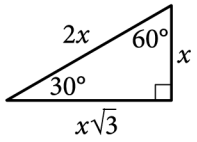

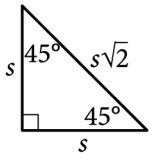

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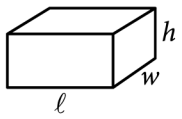
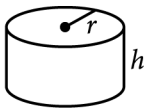


$V = \ell wh$



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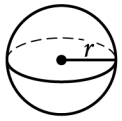

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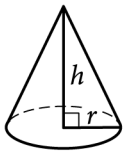
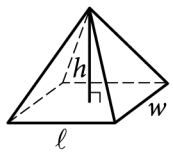


$V = \frac{1}{3}\pi r^2 h$



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

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

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

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

CONTINUE

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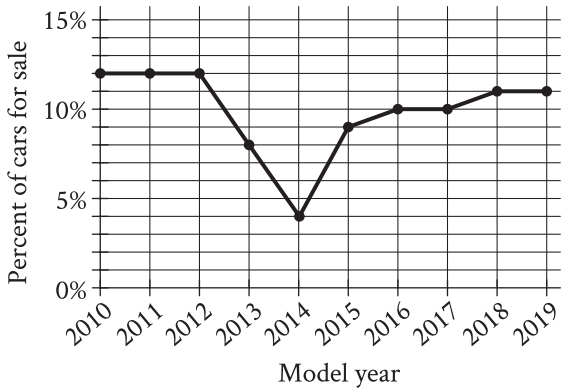
CONTINUE

1

The line graph shows the percent of cars for sale at a used car lot on a given day by model year.



For what model year is the percent of cars for sale the smallest?

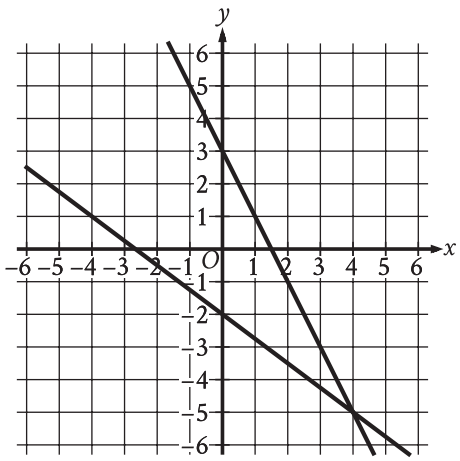
A) 2012

B) 2013

C) 2014

D) 2015

2



The graph of a system of linear equations is shown. What is the solution (x, y) to the system?

A) $(4, -5)$

B) $(0, 3)$

C) $(0, -2)$

D) $(-2, 3)$

CONTINUE

3

The total cost, in dollars, to rent a surfboard consists of a \$25 service fee and a \$10 per hour rental fee. A person rents a surfboard for t hours and intends to spend a maximum of \$75 to rent the surfboard. Which inequality represents this situation?

A) $10t \leq 75$

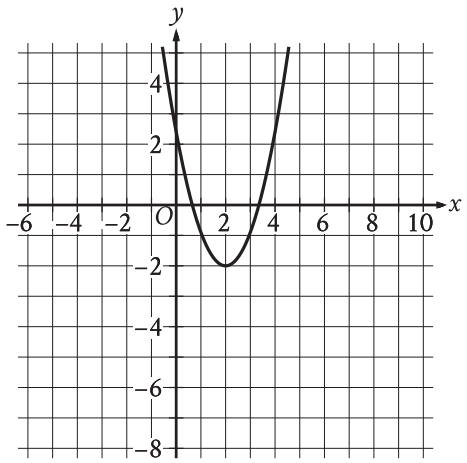
B) $10 + 25t \leq 75$

C) $25t \leq 75$

D) $25 + 10t \leq 75$

CONTINUE

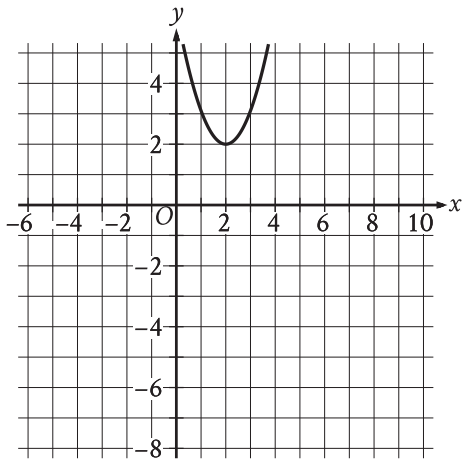
4



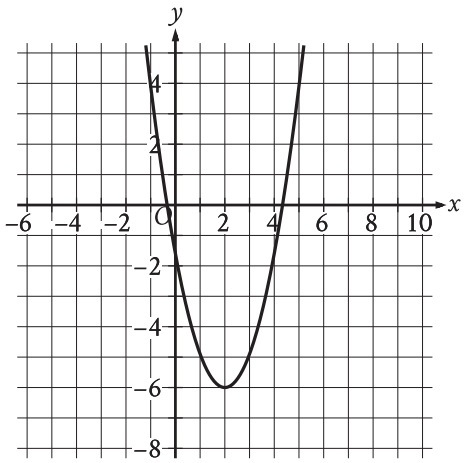
The graph shown will be translated up 4 units. Which of the following will be the resulting graph?

CONTINUE

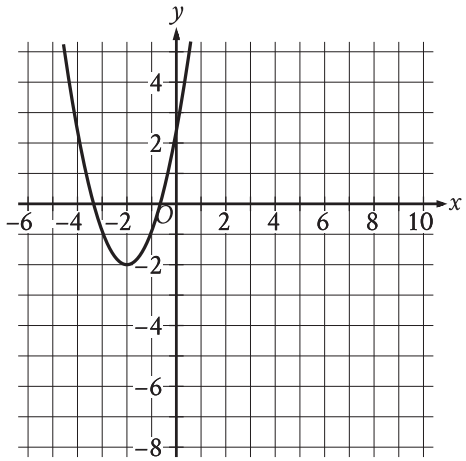
A)



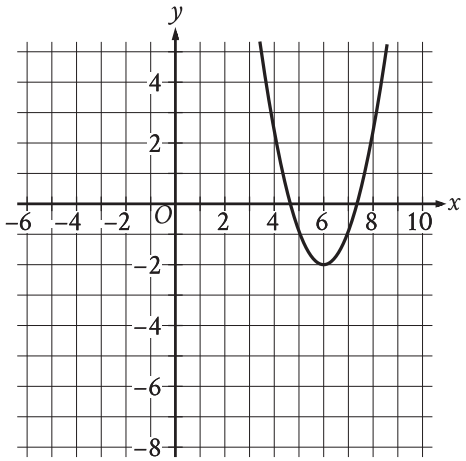
B)



C)



D)



CONTINUE

5

$$s = 40 + 3t$$

The equation gives the speed s, in miles per hour, of a certain car t seconds after it began to accelerate. What is the speed, in miles per hour, of the car 5 seconds after it began to accelerate?

A) 40

B) 43

C) 45

D) 55

6

The function f is defined by $f(x) = x^2 + x + 71$. What is the value of $f(2)$?

7

An event planner is planning a party. It costs the event planner a onetime fee of \$35 to rent the venue and \$10.25 per attendee. The event planner has a budget of \$300. What is the greatest number of attendees possible without exceeding the budget?

8

The table gives the distribution of votes for a new school mascot and grade level for 80 students.

	Grade level			
Mascot	Sixth	Seventh	Eighth	Total
Badger	4	9	9	22
Lion	9	2	9	20
Longhorn	4	6	4	14
Tiger	6	9	9	24
Total	23	26	31	80

If one of these students is selected at random, what is the probability of selecting a student whose vote for new mascot was for a lion?

A) $\frac{1}{9}$

B) $\frac{1}{5}$

C) $\frac{1}{4}$

D) $\frac{2}{3}$

9

Triangles ABC and DEF are congruent, where A corresponds to D, and B and E are right angles. The measure of angle A is 18°. What is the measure of angle F ?

A) 18°

B) 72°

C) 90°

D) 162°

CONTINUE

10

If $4x + 2 = 12$, what is the value of $16x + 8$?

A) 40

B) 48

C) 56

D) 60

11

Which expression is equivalent to $(m^4q^4z^{-1})(mq^5z^3)$, where m, q, and z are positive?

A) $m^4q^{20}z^{-3}$

B) $m^5q^9z^2$

C) $m^6q^8z^{-1}$

D) $m^{20}q^{12}z^{-2}$

12

An airplane descends from an altitude of 9,500 feet to 5,000 feet at a constant rate of 400 feet per minute. What type of function best models the relationship between the descending airplane's altitude and time?

A) Decreasing exponential

B) Decreasing linear

C) Increasing exponential

D) Increasing linear

13

$$3x + 6 = 4y$$
$$3x + 4 = 2y$$

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

14

The function f is defined by $f(x) = (x - 6)(x - 2)(x + 6)$. In the xy-plane, the graph of $y = g(x)$ is the result of translating the graph of $y = f(x)$ up 4 units. What is the value of $g(0)$?

15

The function $f(w) = 6w^2$ gives the area of a rectangle, in square feet (ft^2), if its width is w ft and its length is 6 times its width. Which of the following is the best interpretation of $f(14) = 1{,}176$?

A) If the width of the rectangle is 14 ft, then the area of the rectangle is 1,176 ft^2.

B) If the width of the rectangle is 14 ft, then the length of the rectangle is 1,176 ft.

C) If the width of the rectangle is 1,176 ft, then the length of the rectangle is 14 ft.

D) If the width of the rectangle is 1,176 ft, then the area of the rectangle is 14 ft^2.

CONTINUE

16

The number of bacteria in a liquid medium doubles every day. There are 44,000 bacteria in the liquid medium at the start of an observation. Which of the following represents the number of bacteria, y, in the liquid medium t days after the start of the observation?

A) $y = \frac{1}{2}(44{,}000)^t$

B) $y = 2(44{,}000)^t$

C) $y = 44{,}000\left(\frac{1}{2}\right)^t$

D) $y = 44{,}000(2)^t$

17

x	$h(x)$
0	1.23
2	1.54
4	1.94

The table shows the exponential relationship between the number of years, x, since Hana started training in pole vault, and the estimated height $h(x)$, in meters, of her best pole vault for that year. Which of the following functions best represents this relationship, where $x \leq 4$?

A) $h(x) = 1.12(0.23)^x$

B) $h(x) = 1.12(1.23)^x$

C) $h(x) = 1.23(0.12)^x$

D) $h(x) = 1.23(1.12)^x$

18

The function h is defined by $h(x) = 4x + 28$. The graph of $y = h(x)$ in the xy-plane has an x-intercept at $(a, 0)$ and a y-intercept at $(0, b)$, where a and b are constants. What is the value of $a + b$?

A) 21

B) 28

C) 32

D) 35

19

$$y < 5x + 6$$

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
3	17
5	27
7	37

B)

x	y
3	17
5	35
7	37

C)

x	y
3	25
5	35
7	45

D)

x	y
3	21
5	31
7	41

CONTINUE

20

$$y = 4x + 1$$
$$4y = 15x - 8$$

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

21

A right triangle has legs with lengths of 24 centimeters and 21 centimeters. If the length of this triangle's hypotenuse, in centimeters, can be written in the form $3\sqrt{d}$, where d is an integer, what is the value of d ?

22

The floor of a ballroom has an area of 600 square meters. An architect creates a scale model of the floor of the ballroom, where the length of each side of the model is $\frac{1}{10}$ times the length of the corresponding side of the actual floor of the ballroom. What is the area, in square meters, of the scale model?

A) 6
B) 10
C) 60
D) 150

23

Which of the following equations represents a circle in the xy-plane that intersects the y-axis at exactly one point?

A) $(x - 8)^2 + (y - 8)^2 = 16$
B) $(x - 8)^2 + (y - 4)^2 = 16$
C) $(x - 4)^2 + (y - 9)^2 = 16$
D) $x^2 + (y - 9)^2 = 16$

24

In triangles ABC and DEF, angles B and E each have measure 27° and angles C and F each have measure 41°. Which additional piece of information is sufficient to determine whether triangle ABC is congruent to triangle DEF ?

A) The measure of angle A
B) The length of side AB
C) The lengths of sides BC and EF
D) No additional information is necessary.

25

The result of increasing the quantity x by 1,800% is 684. What is the value of x ?

A) 12,996
B) 12,312
C) 38
D) 36

CONTINUE

26

A window repair specialist charges $220 for the first two hours of repair plus an hourly fee for each additional hour. The total cost for 5 hours of repair is $400. Which function f gives the total cost, in dollars, for x hours of repair, where $x \geq 2$?

A) $f(x) = 60x + 100$

B) $f(x) = 60x + 220$

C) $f(x) = 80x$

D) $f(x) = 80x + 220$

27

$$x(x + 1) - 56 = 4x(x - 7)$$

What is the sum of the solutions to the given equation?

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

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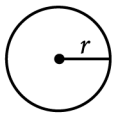

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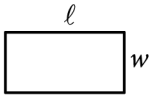

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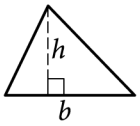

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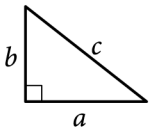

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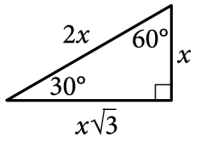

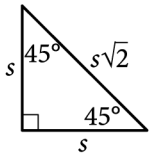

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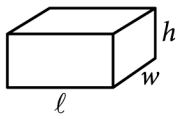

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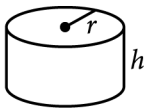

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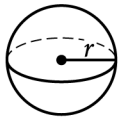

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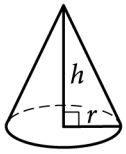
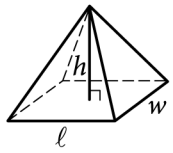


$V = \frac{1}{3}\pi r^2 h$



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

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CONTINUE

1

An object's speed is 64 yards per second. What is the object's speed, in feet per second? (1 yard = 3 feet)

A) 61

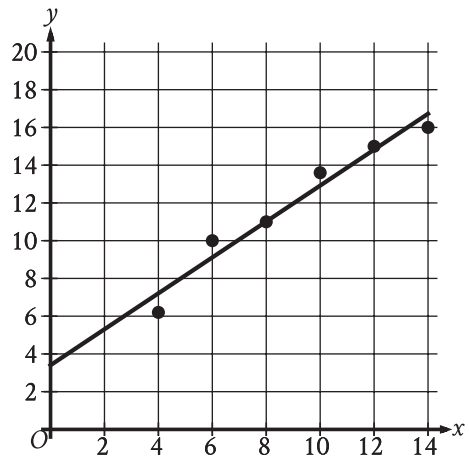
B) 67

C) 94

D) 192

2

The scatterplot shows the relationship between two variables, x and y. A line of best fit is also shown.



Which of the following equations best represents the line of best fit shown?

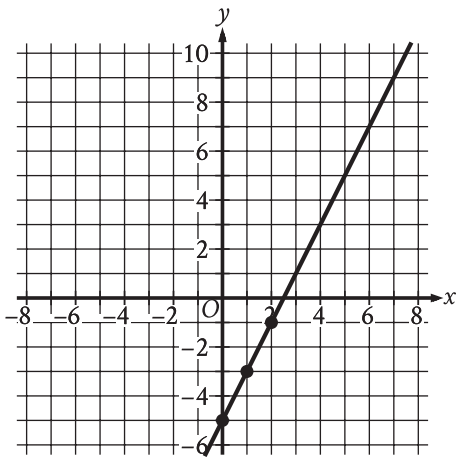
A) $y = x + 3.4$

B) $y = x - 3.4$

C) $y = -x + 3.4$

D) $y = -x - 3.4$

3



The graph shows the linear relationship between x and y. Which table gives three values of x and their corresponding values of y for this relationship?

A)

x	y
0	0
1	−7
2	−9

B)

x	y
0	0
1	−3
2	−1

C)

x	y
0	−5
1	−7
2	−9

D)

x	y
0	−5
1	−3
2	−1

CONTINUE

4

What is the perimeter, in inches, of a rectangle with a length of 4 inches and a width of 9 inches?

A) 13

B) 17

C) 22

D) 26

5

$$7m = 2(n + p)$$

The given equation relates the positive numbers m, n, and p. Which equation correctly gives m in terms of n and p ?

A) $m = \dfrac{2(n + p)}{7}$

B) $m = 2(n + p)$

C) $m = 2(n + p) - 7$

D) $m = 2 - n - p - 7$

6

73, 74, 75, 77, 79, 82, 84, 85, 91

What is the median of the data shown?

7

The function f is defined by $f(x) = 4x$. For what value of x does $f(x) = 8$?

8

Of 300,000 paper clips, 234,000 are size large. What percentage of the paper clips are size large?

A) 22%

B) 33%

C) 66%

D) 78%

9

$$f(x) = 8x + 4$$

The function f gives the estimated height, in feet, of a willow tree x years after its height was first measured. Which statement is the best interpretation of 4 in this context?

A) The tree will be measured each year for 4 years.

B) The tree is estimated to grow to a maximum height of 4 feet.

C) The estimated height of the tree increased by 4 feet each year.

D) The estimated height of the tree was 4 feet when it was first measured.

CONTINUE

10

$$y = 76$$
$$y = x^2 - 5$$

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

A) $-\frac{76}{5}$

B) -9

C) 5

D) 76

11

Each side of equilateral triangle S is multiplied by a scale factor of k to create equilateral triangle T. The length of each side of triangle T is greater than the length of each side of triangle S. Which of the following could be the value of k ?

A) $\frac{29}{28}$

B) 1

C) $\frac{28}{29}$

D) 0

12

$$66x = 66x$$

How many solutions does the given equation have?

A) Exactly one

B) Exactly two

C) Infinitely many

D) Zero

13

Vivian bought party hats and cupcakes for $71. Each package of party hats cost $3, and each cupcake cost $1. If Vivian bought 10 packages of party hats, how many cupcakes did she buy?

14

The exponential function g is defined by $g(x) = 19 \cdot a^x$, where a is a positive constant. If $g(3) = 2{,}375$, what is the value of $g(4)$?

CONTINUE

15

In right triangle RST, the sum of the measures of angle R and angle S is 90 degrees. The value of $\sin(R)$ is $\frac{\sqrt{15}}{4}$. What is the value of $\cos(S)$?

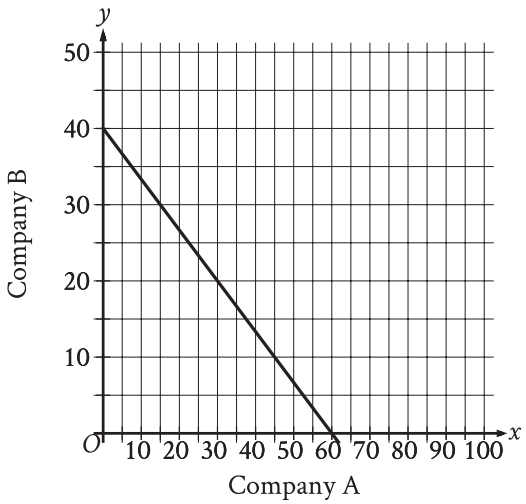
A) $\frac{\sqrt{15}}{15}$

B) $\frac{\sqrt{15}}{4}$

C) $\frac{4\sqrt{15}}{15}$

D) $\sqrt{15}$

16



The graph shows the relationship between the number of shares of stock from Company A, x, and the number of shares of stock from Company B, y, that Simone can purchase. Which equation could represent this relationship?

A) $y = 8x + 12$

B) $8x + 12y = 480$

C) $y = 12x + 8$

D) $12x + 8y = 480$

CONTINUE

17

Which expression is equivalent to $\frac{8x(x-7)-3(x-7)}{2x-14}$, where $x > 7$?

A) $\frac{x-7}{5}$

B) $\frac{8x-3}{2}$

C) $\frac{8x^2-3x-14}{2x-14}$

D) $\frac{8x^2-3x-77}{2x-14}$

18

The function f is defined by $f(x) = (-8)(2)^x + 22$. What is the y-intercept of the graph of $y = f(x)$ in the xy-plane?

A) $(0, 14)$

B) $(0, 2)$

C) $(0, 22)$

D) $(0, -8)$

19

Keenan made 32 cups of vegetable broth. Keenan then filled x small jars and y large jars with all the vegetable broth he made. The equation $3x + 5y = 32$ represents this situation. Which is the best interpretation of $5y$ in this context?

A) The number of large jars Keenan filled

B) The number of small jars Keenan filled

C) The total number of cups of vegetable broth in the large jars

D) The total number of cups of vegetable broth in the small jars

20

A circle in the xy-plane has a diameter with endpoints $(2, 4)$ and $(2, 14)$. An equation of this circle is $(x-2)^2 + (y-9)^2 = r^2$, where r is a positive constant. What is the value of r ?

21

Line ℓ is defined by $3y + 12x = 5$. Line n is perpendicular to line ℓ in the xy-plane. What is the slope of line n ?

CONTINUE

22

$$|-5x + 13| = 73$$

What is the sum of the solutions to the given equation?

A) $-\frac{146}{5}$

B) -12

C) 0

D) $\frac{26}{5}$

23

For the exponential function f, the value of $f(1)$ is k, where k is a constant. Which of the following equivalent forms of the function f shows the value of k as the coefficient or the base?

A) $f(x) = 50(1.6)^{x+1}$

B) $f(x) = 80(1.6)^{x}$

C) $f(x) = 128(1.6)^{x-1}$

D) $f(x) = 204.8(1.6)^{x-2}$

24

$$-9x^2 + 30x + c = 0$$

In the given equation, c is a constant. The equation has exactly one solution. What is the value of c ?

A) 3

B) 0

C) −25

D) −53

25

Which of the following expressions has a factor of $x + 2b$, where b is a positive integer constant?

A) $3x^2 + 7x + 14b$

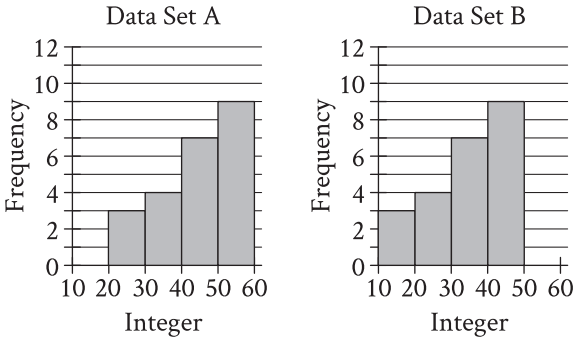
B) $3x^2 + 28x + 14b$

C) $3x^2 + 42x + 14b$

D) $3x^2 + 49x + 14b$

CONTINUE

26



Two data sets of 23 integers each are summarized in the histograms shown. For each of the histograms, the first interval represents the frequency of integers greater than or equal to 10, but less than 20. The second interval represents the frequency of integers greater than or equal to 20, but less than 30, and so on. What is the smallest possible difference between the mean of data set A and the mean of data set B?

A) 0

B) 1

C) 10

D) 23

27

The perimeter of an equilateral triangle is 624 centimeters. The height of this triangle is $k\sqrt{3}$ centimeters, 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.

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.