1 Factor: $x^2 + 15x - 54$

A $(x - 9)(x + 6)$
B $(x + 9)(x - 6)$
C $(x - 3)(x + 18)$
D $(x + 3)(x - 18)$

2 What are the coordinates of the midpoint of a line segment with endpoints $(-1, 3)$ and $(5, 7)$?

F $(2, 5)$
G $(3, 2)$
H $(5, 2)$
J $(6, 4)$

3 What is the value of $\sqrt{\frac{25}{16}} - \sqrt{\frac{36}{25}}$?

A $\frac{7}{400}$

B $\frac{1}{20}$

C $\frac{29}{400}$

D $\frac{7}{20}$

4 What is the value of the expression when $x = 4$ and $y = -2$?

$$\frac{x^2}{2} + xy^3$$

F -28
G -24
H -20
J -16

5 Which set of numbers is ordered from greatest to least?

A $\left\{\frac{13}{8}, \sqrt{3}, 1.75, \frac{9}{5}\right\}$

B $\left\{\sqrt{3}, \frac{9}{5}, 1.75, \frac{13}{8}\right\}$

C $\left\{\frac{9}{5}, 1.75, \frac{13}{8}, \sqrt{3}\right\}$

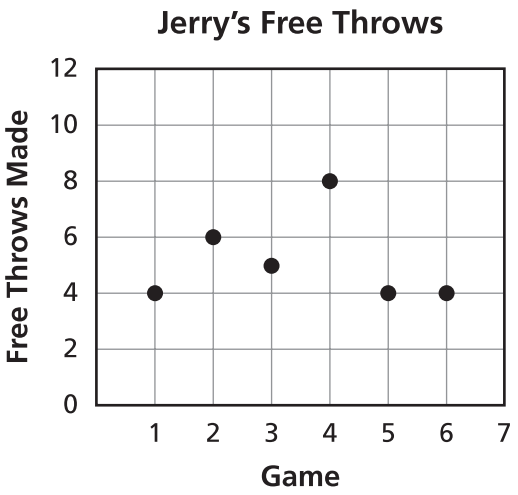
D $\left\{\frac{9}{5}, 1.75, \sqrt{3}, \frac{13}{8}\right\}$

6 An 8-ounce package of cheese costs \$4.29. Which is closest to the cost per pound?

F \$0.54
G \$2.15
H \$6.29
J \$8.58

Go On ▶

7 The scatterplot shows the number of free throws Jerry made in six basketball games.



For game seven, which number of free throws that Jerry could make would be considered an outlier?

A 3
B 4
C 8
D 12

8 $(5m^3 + 2m^2 - m) + (m^2 + 4m - 2) =$

F $5m^3 + 3m^2 - 5m + 2$
G $5m^3 + 3m^2 + 3m - 2$
H $5m^3 + 2m^2 - 5m - 2$
J $5m^3 + 2m^2 + 3m + 2$

Go On ▶

9 Which expression is closest to $(9.06 \times 10^{-5})(6.022 \times 10^{23})$?

A 1.51×10^{18}

B 1.51×10^{19}

C 5.46×10^{18}

D 5.46×10^{19}

10 Simplify $\frac{x^2 - x - 6}{2x^2 + x - 6}$ for all values of x for which the expression is defined.

F $x^2 + 2x$

G $3x^2 - 12$

H $\frac{x - 3}{2x - 3}$

J $\frac{x - 3}{2x + 3}$

Go On ▶

11 **Solve:** $20x - 18 < 50 < 36x - 16$

A $1\frac{5}{6} < x < 3\frac{2}{5}$

B $1\frac{5}{6} < x < \frac{17}{18}$

C $1\frac{3}{5} < x < 3\frac{2}{5}$

D $1\frac{3}{5} < x < \frac{17}{18}$

12 Nyesha earns $1,000 per month plus a commission of 5% of the total dollar amount of each sale she makes. Her total monthly earnings, P, are represented by the equation $P = 1{,}000 + 0.05t$, where t represents the total dollar amount of her sales for the month. Which equation will represent her total monthly earnings in dollars if her commission increases an additional 2%?

F $P = 1{,}200 + 0.05t$

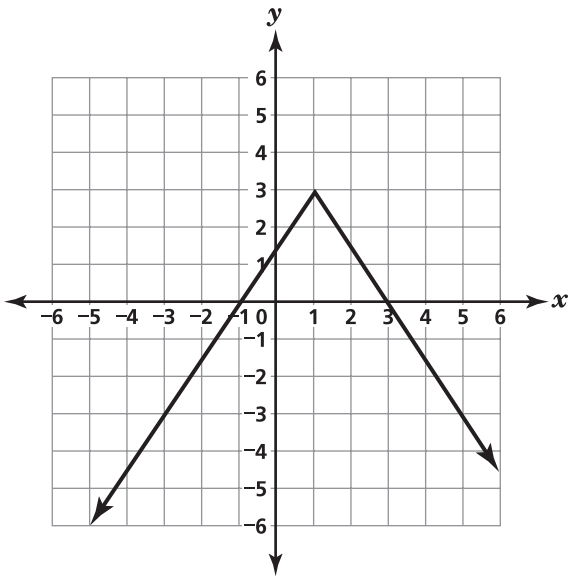
G $P = 1{,}000 + 0.02t$

H $P = 1{,}200 + 0.07t$

J $P = 1{,}000 + 0.07t$

Go On ▶

13 This graph represents a relation.



Which set of ordered pairs is included in this relation?

A $\{(-3,-3),(0,3),(3,1)\}$

B $\{(0,-1),(2,2),(4,-1)\}$

C $\{(-5,-6),(3,0),(5,-3)\}$

D $\{(-4,-4),(-2,-2),(4,-3)\}$

14 Which function represents the data shown in this table?

n	$f(n)$
1	4
2	11
3	18
4	25
5	32

F $f(n) = 3n + 1$

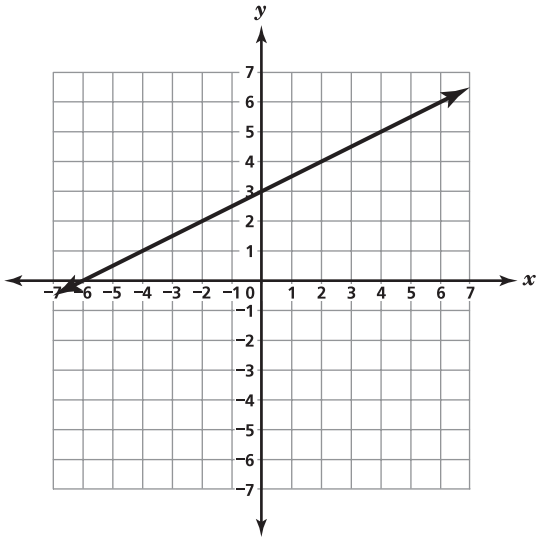
G $f(n) = 5n + 3$

H $f(n) = 6n - 1$

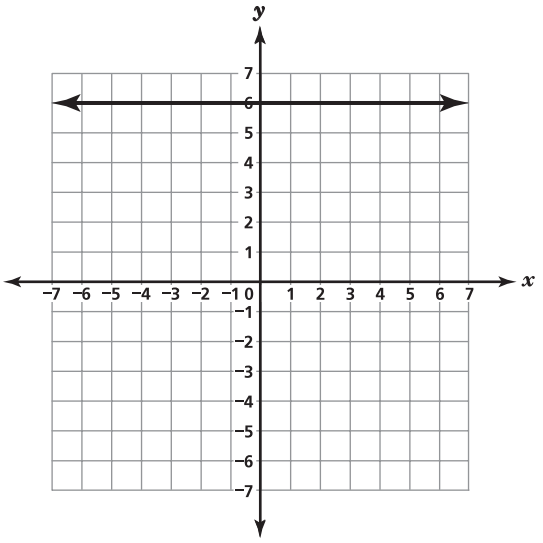
J $f(n) = 7n - 3$

Go On ▶

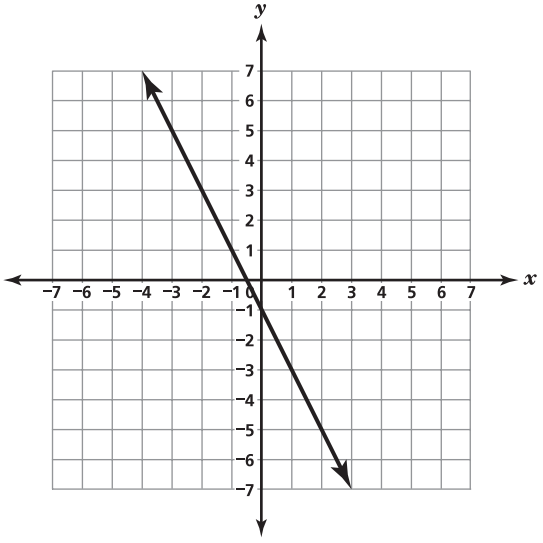
15 Which graph represents a relation that is not a function?



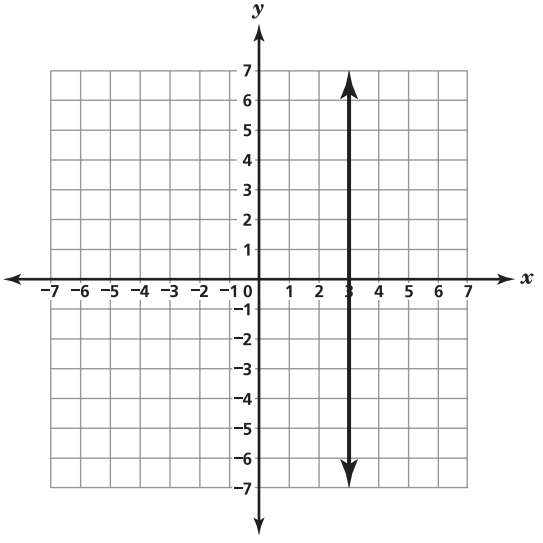
A



C



B



D

Go On ▶

16 $(x-k)(y-k) =$

F $xy - k^2$

G $xy + k^2$

H $xy - xk - ky + k^2$

J $xy + xk + ky - k^2$

17 Simplify the expression below and state all restrictions on the domain.

$$\frac{x^2 - 11x + 28}{x^2 - 4x - 21}$$

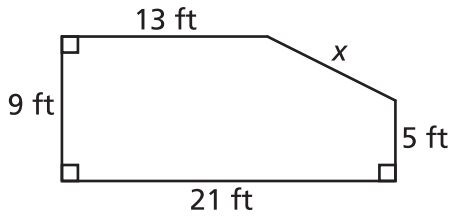
A $\frac{x+4}{x-3}$, $x \neq -7$ and $x \neq 3$

B $\frac{x+4}{x-3}$, $x \neq -4$ and $x \neq 3$

C $\frac{x-4}{x+3}$, $x \neq -3$ and $x \neq 7$

D $\frac{x-4}{x+3}$, $x \neq -3$ and $x \neq 4$

18 The diagram below shows the dimensions for the top surface of a patio.



What is the dimension, in feet (ft), represented by x?

F $4\sqrt{3}$

G $4\sqrt{5}$

H $4\sqrt{13}$

J $4\sqrt{17}$

Go On ▶

19 Katie rented a moving truck. The total rental cost included a one-time fee of $40.00 and $0.75 for each mile driven. Which equation represents t, the total cost in dollars of renting a truck that was driven n miles?

A $t = 40 + 0.75n$

B $t = 40 + \frac{0.75}{n}$

C $t = 0.75 + 40n$

D $t = 0.75 + \frac{40}{n}$

20 Marcel has a data set for which the mean is 33. Each value in the data set is multiplied by 5. What is the mean for the new data set?

F 5

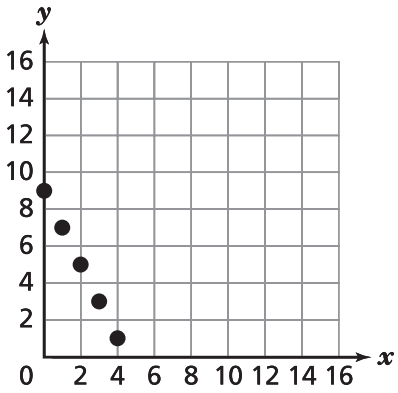
G 33

H 132

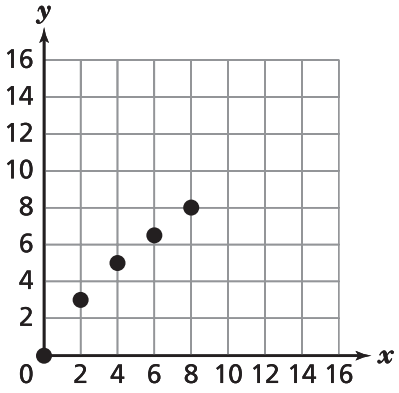
J 165

Go On ▶

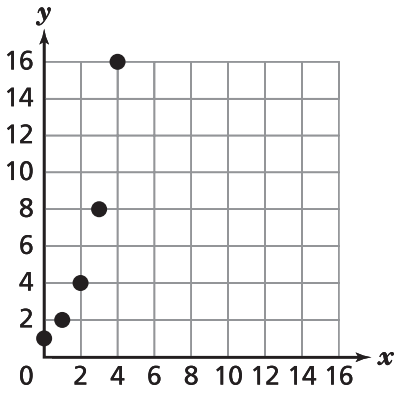
21 Which scatterplot best represents a negative linear relationship between the variables x and y?



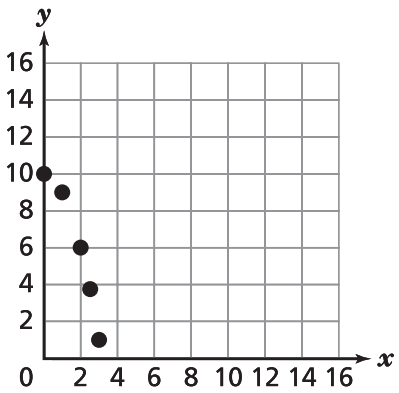
A



C



B



D

Go On ▶

22 A lawn can be mowed at an average rate of 44 square feet per minute. Which is closest to this rate in square yards per second?

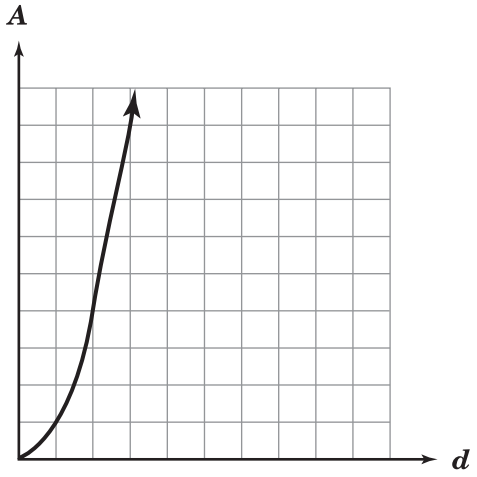
F 0.01
G 0.08
H 0.24
J 0.31

23 Which expression is equivalent to $\left(\sqrt{2x^2}\right)^4$?

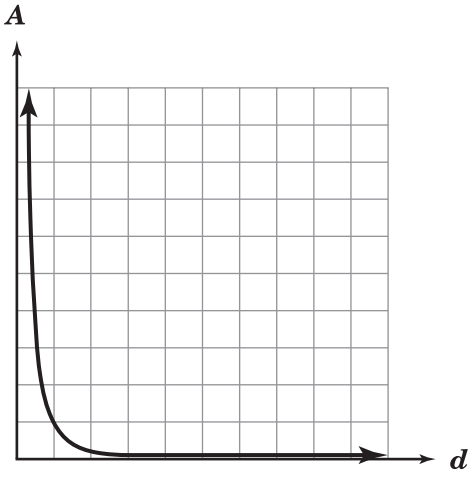
A $2x^4$
B $4x^4$
C $4x^8$
D $8x^8$

Go On ▶

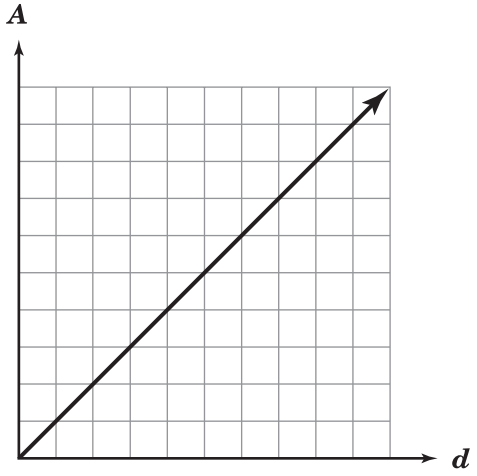
24 The function $A = \frac{\pi d^2}{4}$ shows the relationship between the area, A, of a circle and its diameter, d. Which graph best represents this relationship?



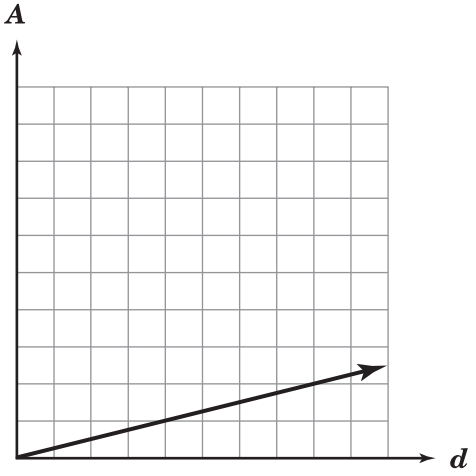
F



H



G



J

Go On ▶

25 This table shows the number of cans placed in a collection bin during a food drive.

Food Drive Results

Type of Food	Number of Cans
Vegetable	2,578
Fruit	1,359
Meat	1,240
Sauce	580

One can will be randomly selected from the bin. Which is closest to the probability that the can selected will contain fruit or sauce?

A 0.10
B 0.24
C 0.34
D 0.66

26 Which function represents the linear pattern shown in the table?

x	$f(x)$
1	–2
2	1
3	4
4	7

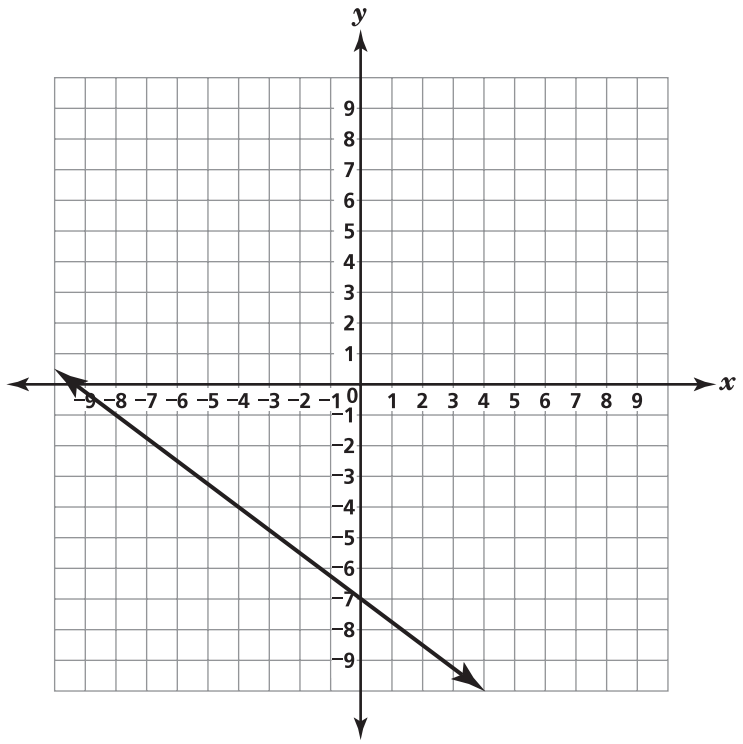
F $f(x) = 3x - 5$
G $f(x) = 2x - 4$
H $f(x) = x + 3$
J $f(x) = x + 1$

27 **Simplify:** $2x^4(3x^3 - x^2 + 5x)$

A $6x^7 - x^2 + 5x$
B $6x^{12} - x^2 + 5x$
C $6x^7 - 2x^6 + 10x^5$
D $6x^{12} - 2x^8 + 10x^4$

Go On ▶

28 Which equation best represents the graph of the line?



F $y = \frac{4}{3}x - 7$

G $y = \frac{3}{4}x - 7$

H $y = -\frac{4}{3}x - 7$

J $y = -\frac{3}{4}x - 7$

Go On ▶

29 Marta is buying a car from her sister for $12,294. After making an initial payment of $1,200, she agrees to pay $258 per month for n months. Which equation can Marta use to determine the number of months, n, it will take her to finish paying for the car?

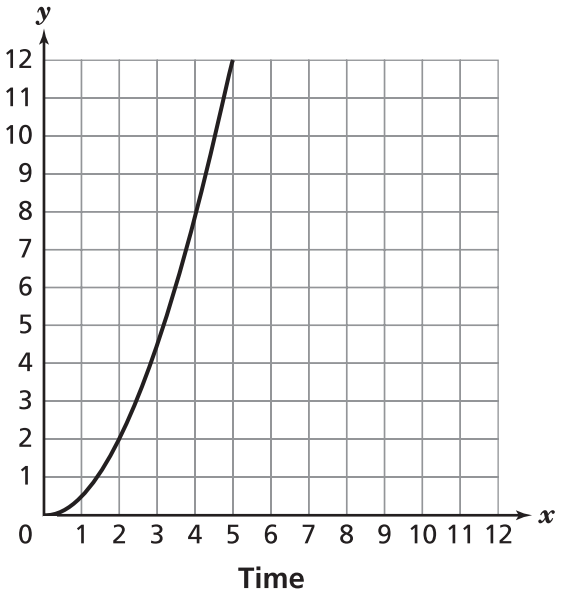
A $1{,}200n + 258 = 12{,}294$

B $1{,}200 + 258n = 12{,}294$

C $\frac{(1{,}200 + 258)}{n} = 12{,}294$

D $\frac{(1{,}200 - 258)}{n} = 12{,}294$

30 The graph represents a function related to a train's movement over time.



Which function could this graph represent?

F the speed of a train as it decreases its rate of acceleration

G the speed of a train as it slows down when approaching a station

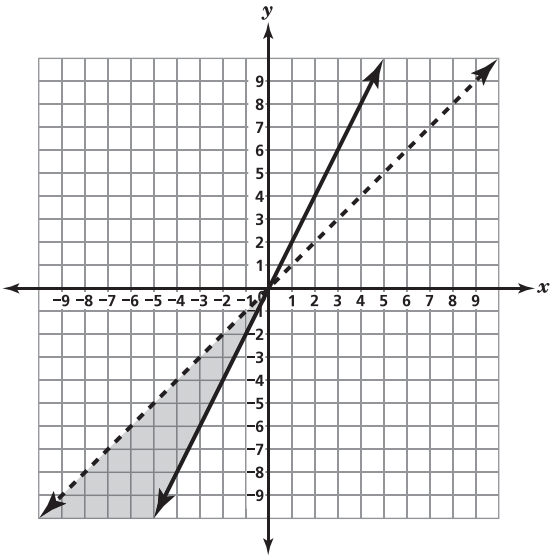
H the distance of a train from a station it has departed as it accelerates

J the distance of a train from a station it approaches at a constant speed

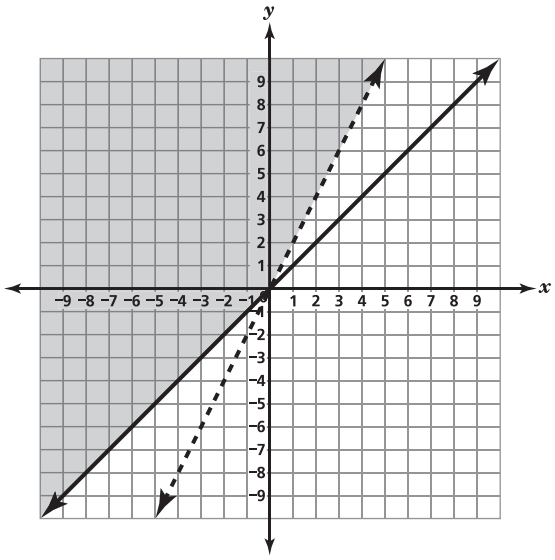
Go On ▶

31 Which graph best represents the solution to the system of linear inequalities?

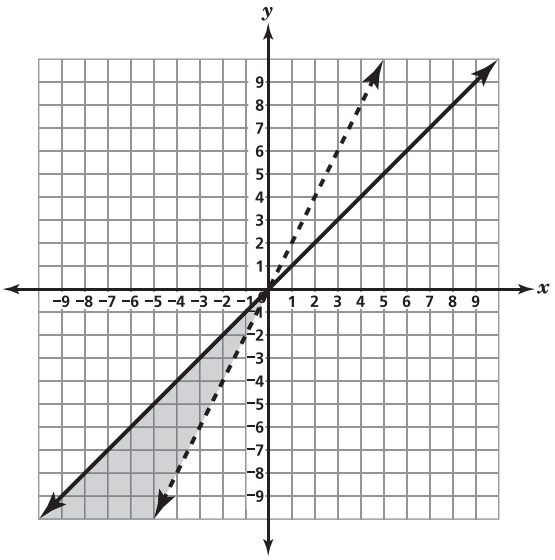
$$x - y < 0$$
$$3y - 6x \geq 0$$



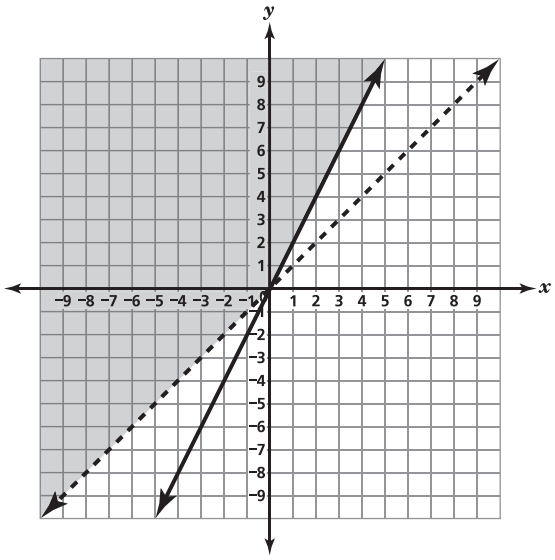
A



C



B



D

Go On ▶

32 This table shows the number of tickets remaining in the first six rows of a theater for an upcoming concert.

Concert Tickets Remaining

Row	Number of Tickets
A	3
B	2
C	4
D	4
E	6
F	5

On the day of the concert, the number of remaining tickets in Row A decreases by 1, while the number of remaining tickets in Row F decreases by 3. What is the effect of these changes on the mode of the data?

F The mode decreases by 2.

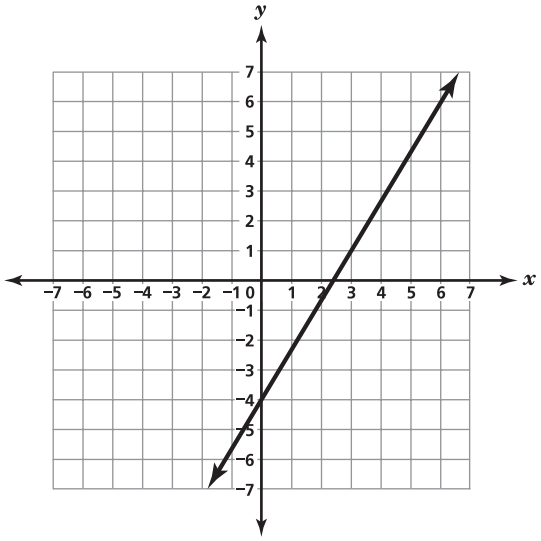
G The mode decreases by 1.

H The mode increases by 2.

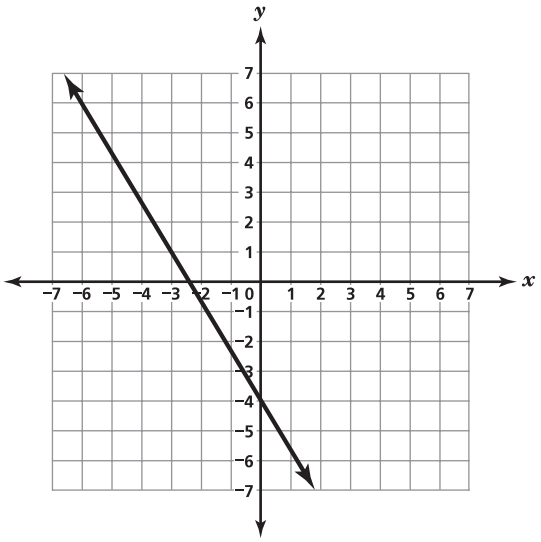
J The mode increases by 1.

Go On ▶

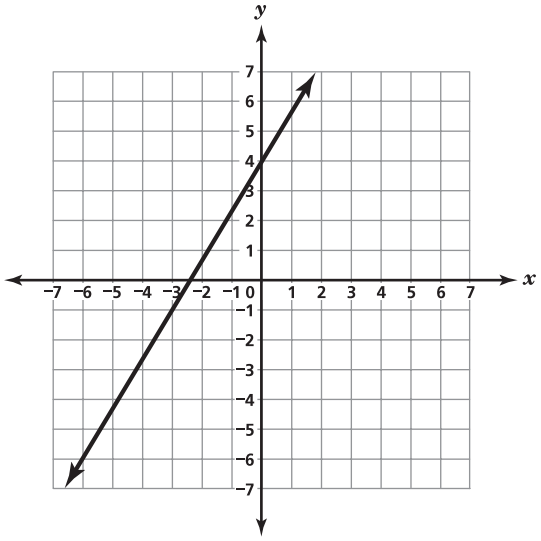
33 Which graph best represents the equation $5x - 3y = 12$?



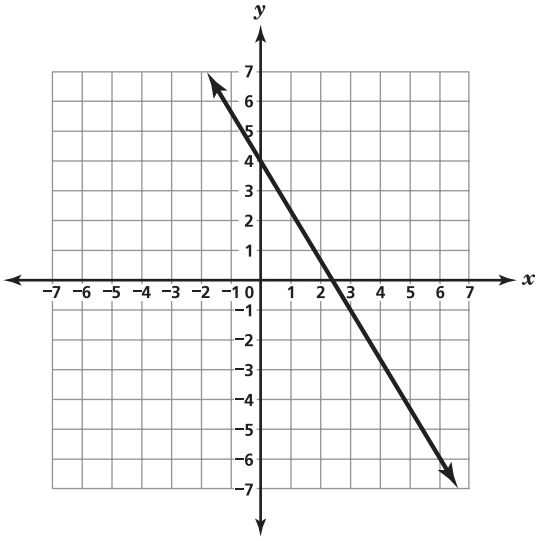
A



C



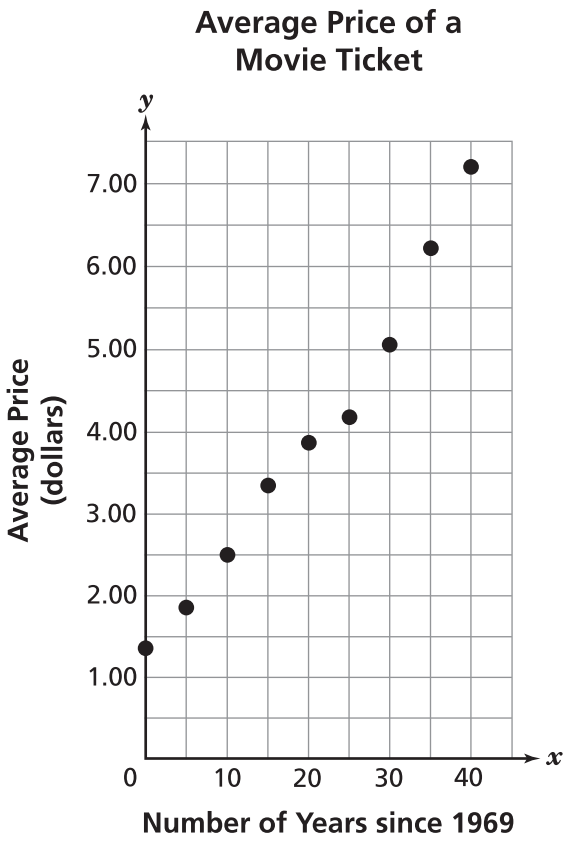
B



D

Go On ▶

34 The average price of a movie ticket, over a period of several years, is shown in the graph below.



If the trend continues, what is the best prediction of the average price of a movie ticket in 2024?

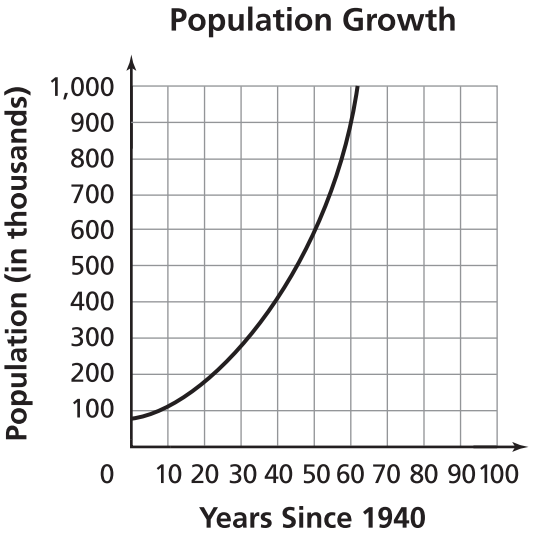
F $4.20
G $6.90
H $8.85
J $10.95

35 Which ordered pair, (x, y), represents the solution for the system of equations?

$$2.5x + 7.5y = 75$$
$$x + y = 12$$

A (3, 9)
B (9, 3)
C (2, 10)
D (10, 2)

36 The graph shows the growth in population for a city since 1940.



Which best describes the population for the year 2000?

F less than 100,000
G about 180,000
H about 900,000
J more than 1,000,000

Go On ▶

37 At the beginning of year 1, Katherine deposits $100 in an account that pays 5% interest compounded annually. She makes no other deposits or withdrawals. The amount in the account at the beginning of each year is shown in the table.

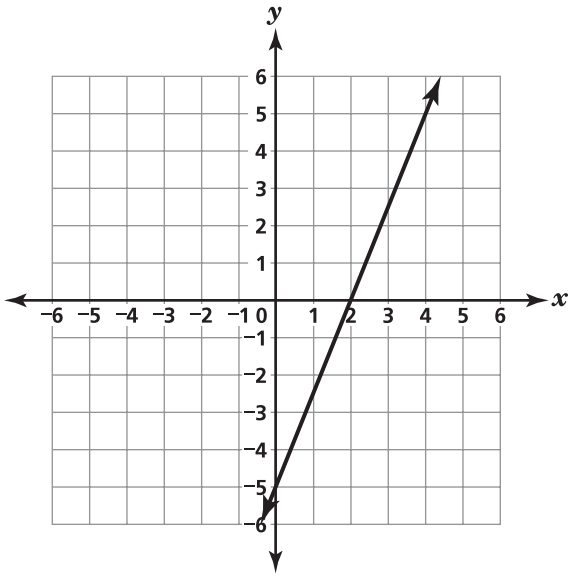
Katherine's Account

Year, n	Amount in Account, $A(n)$
1	100
2	100(1.05)
3	$100(1.05)^2$
4	$100(1.05)^3$

Which function represents $A(n)$, the amount in Katherine's account at the beginning of year n?

A $A(n) = 100$
B $A(n) = 100(1.05)^{n-1}$
C $A(n) = 100(1.05)^{n}$
D $A(n) = 100(1.05)^{n+1}$

38 Which equation best represents the line shown?



F $y = 0.4x - 5$
G $y = 0.4x + 2$
H $y = 2.5x - 5$
J $y = 2.5x + 2$

39 Which number is a solution to $3x - 19 > 5x - 7$ or $6x - 27 > 30 + 3x$?

A -19
B -5
C 5
D 19

Go On ▶

40 The table shows the 2008 United States first-class postage rate, $d(w)$, for packages of maximum weight, w.

Postage Rate for Packages in 2008

Maximum Weight in Ounces, w	Postage Rate, $d(w)$
1	\$1.17
2	\$1.34
3	\$1.51
4	\$1.68
5	\$1.85
6	\$2.02
7	\$2.19
8	\$2.36
9	\$2.53
10	\$2.70

The pattern in the table continues. Which value represents the postage rate of a 13-ounce package?

F \$2.21
G \$2.87
H \$3.21
J \$4.21

41 Carlos and Amanda played a game. This table shows the results.

Game Results

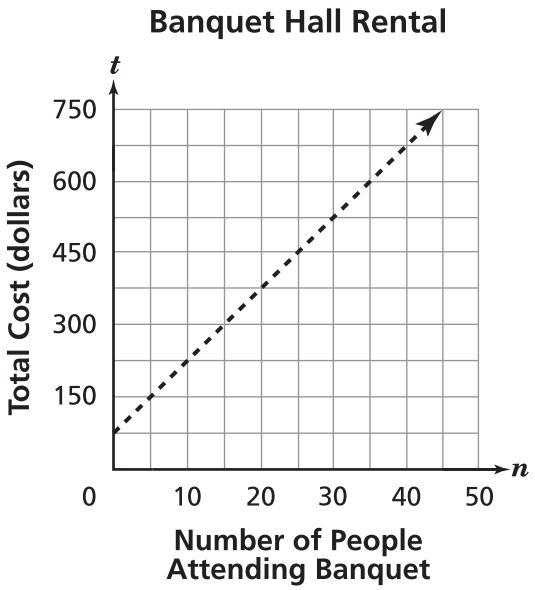
Result	Frequency
Carlos wins	4
Amanda wins	5
Tie	3

What is the experimental probability that there will be a tie between Carlos and Amanda?

A $\frac{1}{4}$
B $\frac{1}{3}$
C $\frac{5}{12}$
D $\frac{3}{4}$

Go On ▶

42 The total cost for renting a banquet hall includes a one-time rental fee and a cost per person attending the banquet. The relationship between n, the number of people attending the banquet, and t, the total cost, is shown on the graph.



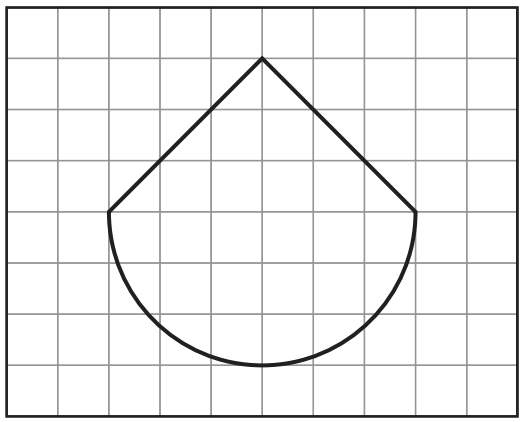
Which equation best represents the relationship between n and t?

F $t = -15n + 75$
G $t = -15n - 75$
H $t = 15n + 75$
J $t = 15n - 75$

43 If $x > -\frac{5}{2}$, which expression is equivalent to $\frac{2x^2 + 7x + 5}{\sqrt{4x^2 + 20x + 25}}$?

A $x + 1$
B $x + 7$
C $-2x^2 - 13x - 20$
D $-2x^2 - 27x - 30$

44 Which is closest to the area of the figure?

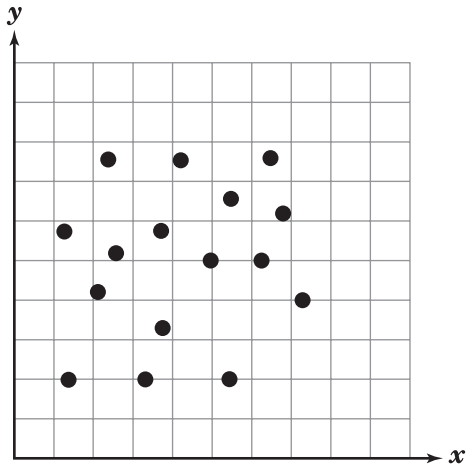


= 1 square unit

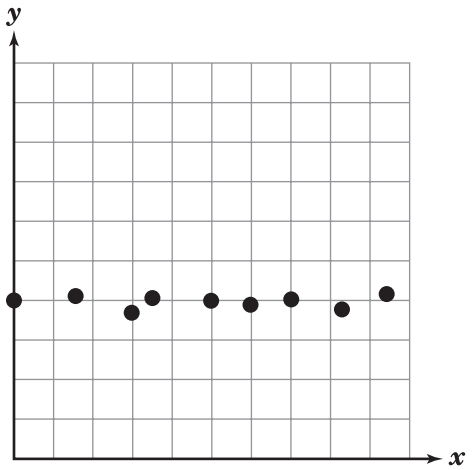
F 18 square units
G 23 square units
H 32 square units
J 37 square units

Go On ▶

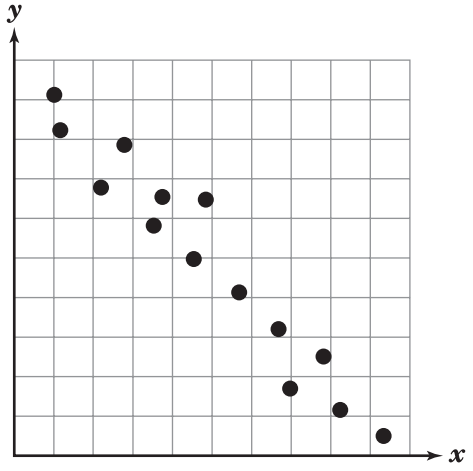
45 Which graph best shows a positive linear relationship between the variables x and y?



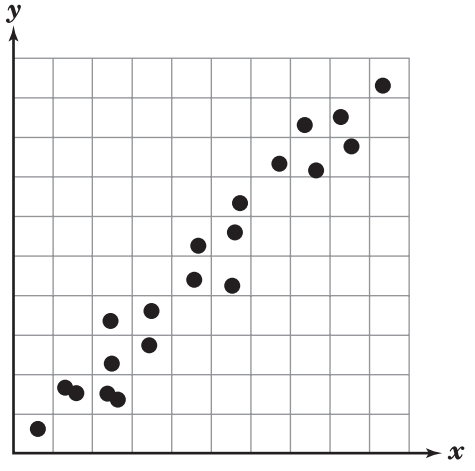
A



C



B



D

Go On ▶

46 This set of data includes the scores that James earned on his last 6 math tests.

{90, 86, 75, 95, 100, 70}

If the lowest score is dropped, which statement is true?

F The range will decrease by 10 points.

G The median score will increase by 2 points.

H The median score will increase by 5 points.

J The mean score will decrease by 3.2 points.

47 The distance in miles, y, a bicyclist is from home after riding x hours is represented by the equation $y = 8x + 7$. What does the slope represent in this situation?

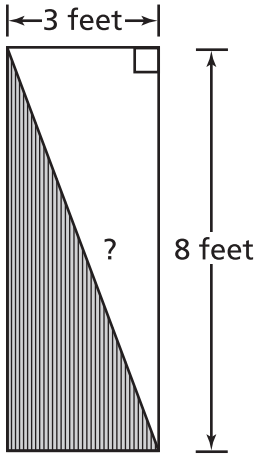
A the number of hours it takes the bicyclist to ride 15 miles

B the distance the bicyclist is from home when $x = 0$

C the steepness of the hill the bicyclist is climbing

D the speed of the bicyclist

48 Ernest plans to paint a small rectangular wall in his apartment as shown.



Which is closest to the length, in feet, of the diagonal strip that separates the two colors?

F 5 feet

G 9 feet

H 11 feet

J 25 feet

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49 Which is an equivalent form for all values of x, y, and z for which the expression is defined?

$$\frac{3x^6y^2z^9}{12x^3y^4z^3}$$

A $\frac{x^2z^3}{4y^2}$

B $\frac{x^3z^6}{4y^2}$

C $\frac{4x^2z^3}{y^2}$

D $\frac{4x^3z^6}{y^2}$

50 Which values of x make the equation true?

$$x^2 + x - 12 = 0$$

F -6 and 2

G -4 and 3

H -3 and 4

J -2 and 6

51 What is the value of the function $f(x) = x^2 - 2x + 2$ when $x = -3$?

A -13

B -1

C 2

D 17

52 A sequence is created from the function $k(n) = 3n + 1$, where n represents the position of the term in the sequence. The sequence does not begin at 0. Which list represents the first five terms of the sequence?

F 5, 6, 7, 8, 9

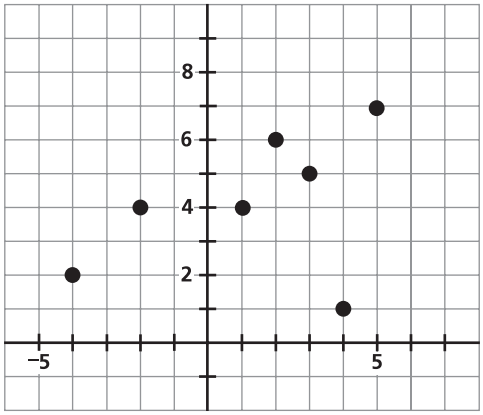
G 4, 7, 10, 13, 16

H 4, 7, 11, 18, 29

J 6, 9, 12, 15, 18

Go On ▶

53 Which set represents the relation shown on the graph?



A $\{1, 2, 4, 5, 6, 7\}$

B $\{-4, -2, 1, 2, 3, 4, 5\}$

C $\{(-4, 2), (-2, 4), (1, 4), (2, 6), (3, 5), (4, 1), (5, 7)\}$

D $\{(2, -4), (4, -2), (4, 1), (6, 2), (5, 3), (1, 4), (7, 5)\}$

Go On ▶

54 Which transformation occurs to the graph of $y = x + 1$ when the equation of the line changes to $y = -x + 1$?

F The line is reflected across the *y*-axis.
G The line is reflected across the *x*-axis.
H The line shifts to the left 1 unit.
J The line shifts down 1 unit.

55 Which compound inequality represents $|6 - 3n| \leq 27$?

A $-27 \leq 6 - 3n \geq 27$
B $-27 \leq 6 - 3n \leq 27$
C $27 \geq 6 - 3n \leq -27$
D $27 \leq 6 - 3n \leq -27$

56 Simplify $(x^2 - x - 2)\left(\frac{x^2 + x - 2}{x^2 - 4}\right)$ for all values of *x* for which the expression is defined.

F $x^2 - 1$
G $x^2 + 1$
H $x^2 + 2x - 1$
J $x^2 - 2x + 1$

57 The distance from Earth to Pluto is approximately 4.3×10^{12} meters. The diameter of Earth is approximately 1.2×10^7 meters. Approximately how many times the diameter of Earth is the distance from Earth to Pluto?

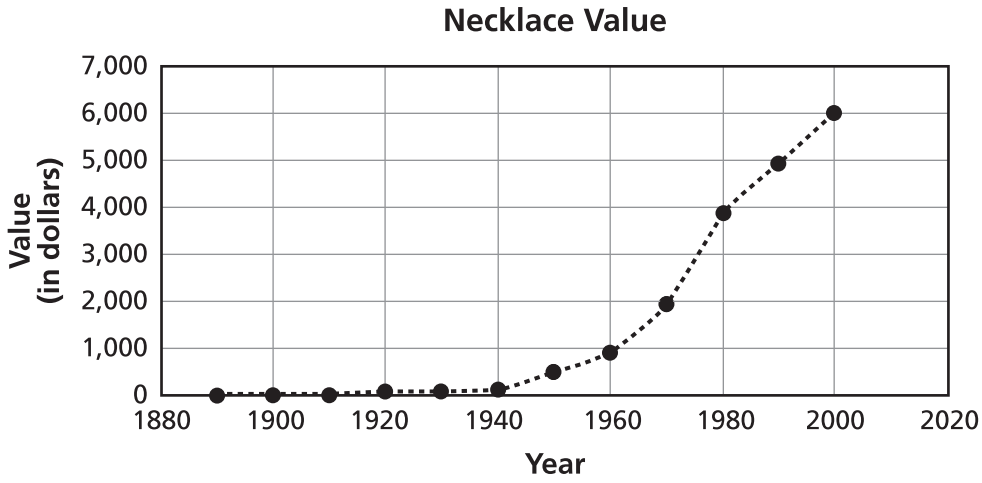
A 0.28
B 3.60
C 2.8×10^4
D 3.6×10^5

58 What is the sum of $k^3 + 2k^2 + 1$ and $3k^2 - 4$?

F $k^3 + 5k^2 - 5$
G $k^3 + 5k^2 - 3$
H $4k^3 + 2k^2 - 5$
J $4k^3 + 2k^2 - 3$

Go On ▶

59 The graph shows the value of a necklace over many years.



What is a reasonable estimate of the value of the necklace in 1982?

A $1,970
B $3,500
C $4,000
D $5,000

60 Which number correctly completes this equation?

12 square feet = ___ square inches

F 144
G 288
H 1,728
J 6,912

61 Which statement best describes the values of the numbers in this set?

$$\left\{\sqrt{\frac{25}{3}}, \sqrt{\frac{36}{5}}, \sqrt{\frac{49}{8}}\right\}$$

A They are between 1 and 2.
B They are between 2 and 3.
C They are between 3 and 4.5.
D They are between 4.5 and 8.

62 Gladys wants to buy a pair of pants that cost $35 before a 20% discount. She knows she can find the cost after the discount, in dollars, by evaluating $35 - 35(0.20)$. She thinks she can get the same cost by evaluating $35(1 - 0.20)$. What property did Gladys use to justify that these two expressions represent the same cost after the discount?

F associative property
G distributive property
H commutative property
J subtraction property of equality

Go On ▶

63 Which expression is equivalent to $\frac{3x}{\sqrt{3}}$?

A x

B $\frac{x}{3}$

C $\frac{x\sqrt{3}}{3}$

D $x\sqrt{3}$

64 What is the length of a segment whose endpoints are $(3, -2)$ and $(7, 6)$?

F $2\sqrt{21}$
G $2\sqrt{29}$
H $4\sqrt{3}$
J $4\sqrt{5}$

65 Which expression is equivalent to $n^2 + 20n + 100$?

A $(n + 10)(n + 10)$
B $(n - 10)(n - 10)$
C $(n + 20)(n + 5)$
D $(n - 20)(n - 5)$

STOP