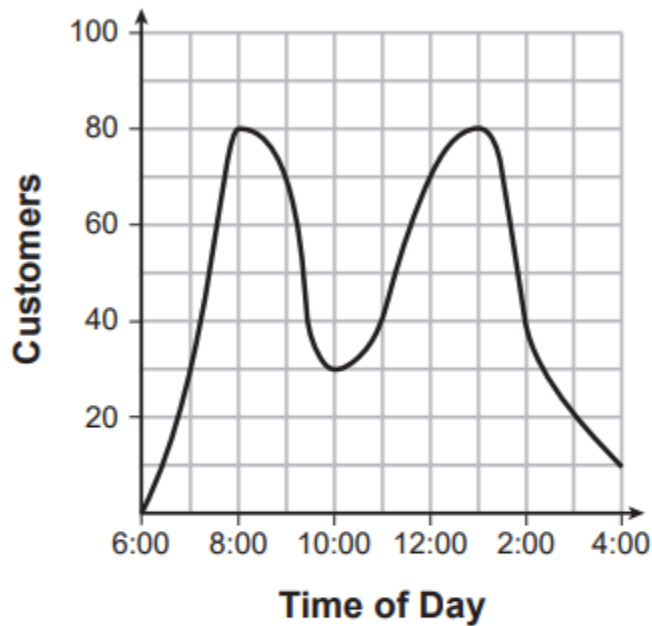Classwork

1.

A café owner tracks the number of customers during business hours. The graph below models the data.

Time of Day

Based on the graph, the café owner saw a continual

(1) increase in customers from 6:00 to 11:00

(2) increase in customers from 12:00 to 3:00

(3) decrease in customers from 1:00 to 4:00

(4) decrease in customers from 11:00 to 2:00

2

The expression $(3x^2 + 4x - 8) + 2(11 - 5x)$ is equivalent to

(1) $3x^2 - x + 5$ (3) $3x^2 - 6x + 14$

(2) $3x^2 - x + 14$ (4) $3x^2 + 14x + 14$

3.

Which point is a solution to $y = x^3 - 2x$?

(1) $(-3, -21)$ (3) $(1, 1)$

(2) $(-2, 10)$ (4) $(4, 2)$

4.

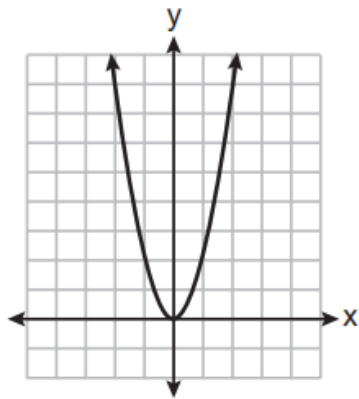What is the value of x in the equation $\dfrac{5(2x - 4)}{3} + 9 = 14$?

(1) 1.9   (3) 5.3

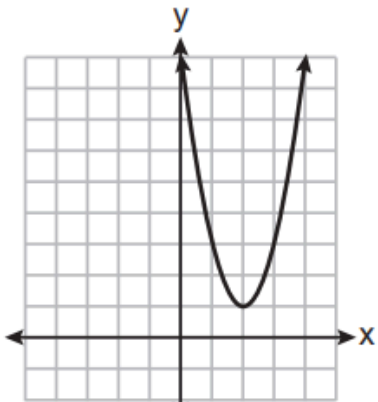(2) 3.5   (4) 8.9
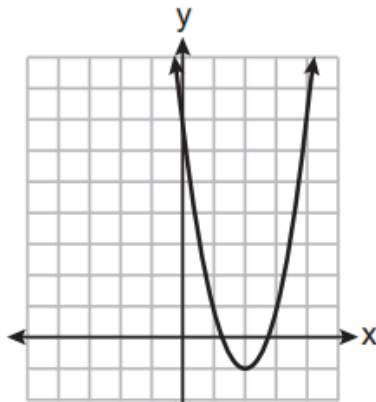
5

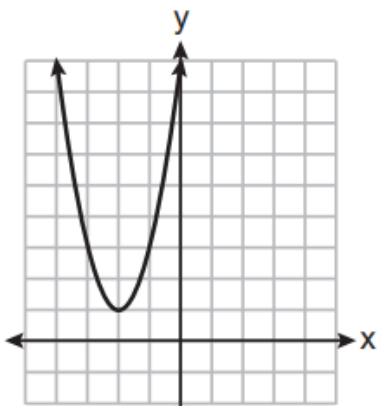The graph of $y = f(x)$ is shown below.

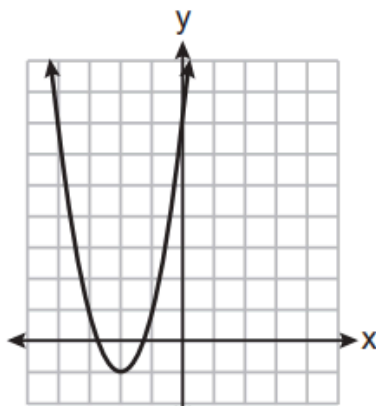Which graph represents $y = f(x - 2) + 1$?

(1)

(3)

(2)

(4)

6

The length of a rectangular flat-screen television is six inches less than twice its width, x. If the area of the television screen is 1100 square inches, which equation can be used to determine the width, in inches?

(1) $x(2x - 6) = 1100$ (3) $2x + 2(2x - 6) = 1100$

(2) $x(6 - 2x) = 1100$ (4) $2x + 2(6 - 2x) = 1100$

7.

A box plot is shown below.
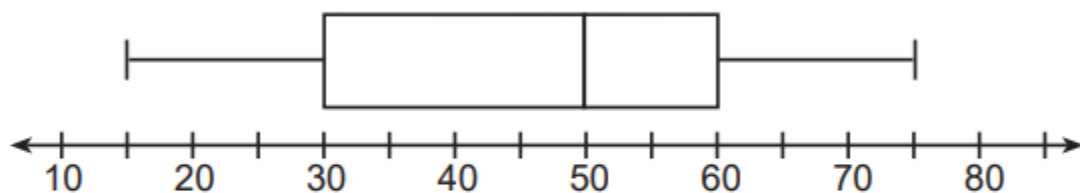
Which number represents the third quartile?

(1) 30   (3) 60

(2) 50   (4) 75

8.

What is the product of $(2x + 7)$ and $(x - 3)$?

(1) $2x^2 - 21$ (3) $2x^2 + 4x - 21$

(2) $2x^2 + x - 21$ (4) $2x^2 + 13x - 21$

9

What is the degree of the polynomial $2x + x^3 + 5x^2$?

(1) 1   (3) 3

(2) 2   (4) 4

10.

What is the solution to $-3(x - 6) > 2x - 2$?

(1) $x > 4$ (3) $x > -16$

(2) $x < 4$ (4) $x < -16$

11.

Three expressions are shown below.

I. $(x^3)^3$

II. $x^4 \cdot x^5$

III. $x^{10} \cdot x^{-1}$

Which expressions are equivalent for all positive values of x?

(1) I and II, only   (3) II and III, only

(2) I and III, only   (4) I, II, and III

12.

Jim uses the equation $A = P(1 + 0.05)^t$ to find the amount of money in an account, A, of an investment, P, after t years. For this equation, which phrase describes the yearly rate of change?

(1) decreasing by 5%   (3) increasing by 5%

(2) decreasing by 0.05%   (4) increasing by 0.05%

13.

What are the zeros of $m(x) = x(x^2 - 16)$?

(1) -4 and 4, only   (3) $-4, 0,$ and 4

(2) -8 and 8, only   (4) $-8, 0,$ and 8

14.

For which function is the value of the y-intercept the *smallest*?

x	f(x)
−4	5
−2	4
0	3
2	2
4	1

(1)

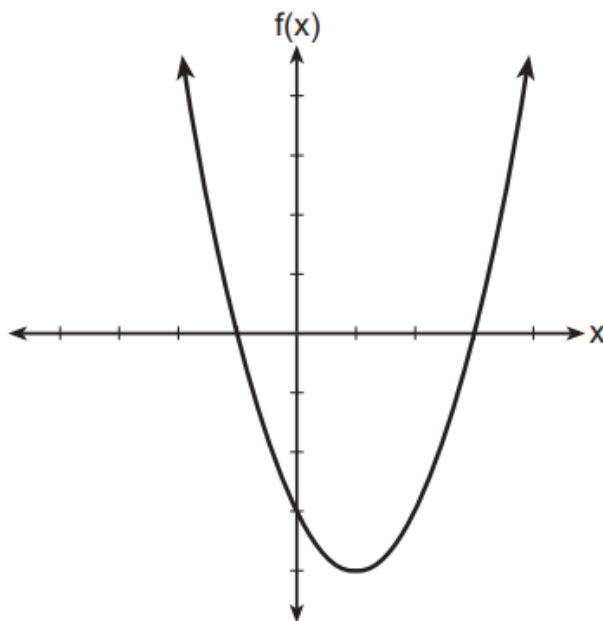| x	h(x)
−1	3
0	2
1	3
2	6
3	11

(3)

$g(x) = |x| + 4$

(2)

$k(x) = 5^x$

(4)

15.

The function f is graphed on the set of axes below.

f(x)

What is a possible factorization of this function?

(1) $f(x) = (x - 1)(x + 3)$ (3) $f(x) = (x + 1)(x - 4)$

(2) $f(x) = (x + 1)(x - 3)$ (4) $f(x) = (x - 1)(x + 4)$

16.

The range of $f(x) = x^2 + 2x - 5$ is the set of all real numbers
(1) less than or equal to -6
(2) greater than or equal to -6
(3) less than or equal to -1
(4) greater than or equal to -1

17.

Tables of values for four functions are shown below.

x	f(x)
0	6
1	7
2	10
3	15
4	22

x	h(x)
0	1
1	2
2	4
3	8
4	16

x	g(x)
0	0
1	-2
2	-2
3	0
4	4

x	j(x)
0	2
1	5
2	8
3	11
4	14

Which table best represents an exponential function?
(1) $f(x)$ (3) $h(x)$
(2) $g(x)$ (4) $j(x)$

18.

If $f(x) = x^2 + 3x$, then which statement is true?

(1) $f(1) = f(-1)$ (3) $f(1) = f(2)$

(2) $f(2) = f(-2)$ (4) $f(-1) = f(-2)$

19

Jack started a new fitness program. The first day he did 10 push-ups. The program required him to increase the number of push-ups each day by doing 9 less than twice the number from the previous day. Which recursive formula correctly models Jack's new program, where n is the number of days and a_n is the number of push-ups on the nth day?

(1) $a_1 = 10$ (3) $a_1 = 10$

     $a_n = 2a_{n-1} - 9$ $a_n = 2(n-1) - 9$

(2) $a_1 = 10$ (4) $a_1 = 10$

     $a_n = 9 - 2a_{n-1}$ $a_n = 9 - 2(n-1)$

20.

Which equation is equivalent to $x^2 - 6x + 4 = 0$?

(1) $(x - 3)^2 = -4$ (3) $(x - 3)^2 = 6$

(2) $(x - 3)^2 = 5$ (4) $(x - 3)^2 = 9$

21.

What is the equation of the line that passes through the point $(6,-3)$ and has a slope of $-\frac{4}{3}$?

(1) $3y = -4x + 15$ (3) $-3y = 4x + 15$
(2) $3y = -4x + 6$ (4) $-3y = 4x + 6$

22

The function $G(m)$ represents the amount of gasoline consumed by a car traveling m miles. An appropriate domain for this function would be

(1) integers

(2) rational numbers

(3) nonnegative integers

(4) nonnegative rational numbers

23

23 The table below shows the number of reported polio cases in Nigeria from 2006 to 2015.

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of Cases	1129	285	798	388	21	62	122	53	60	0

What is the average rate of change, to the *nearest hundredth*, of the number of reported polio cases per year in Nigeria from 2006 to 2013?

(1) -0.01 (3) -134.50
(2) -125.44 (4) -153.71

Joe compared gas prices in England and New York State one day. In England, gas sold for 1.35 euros per liter, and one dollar equaled 0.622 euros. A correct way to figure out this cost, in dollars per gallon, is

(1) $\dfrac{1.35 \text{ euros}}{1 \text{ L}} \cdot \dfrac{1 \text{ L}}{0.264 \text{ gal}} \cdot \dfrac{\$1.00}{0.622 \text{ euros}}$
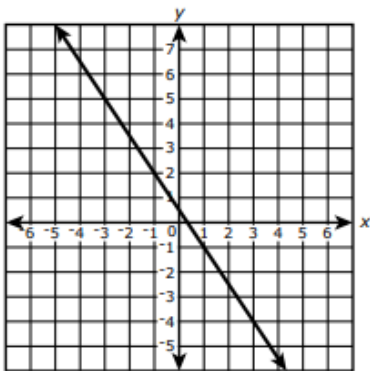
(2) $\dfrac{1.35 \text{ euros}}{1 \text{ L}} \cdot \dfrac{\$1.00}{0.622 \text{ euros}} \cdot \dfrac{0.264 \text{ gal}}{1 \text{ L}}$

(3) $\dfrac{1.35 \text{ euros}}{1 \text{ L}} \cdot \dfrac{1 \text{ L}}{0.264 \text{ gal}} \cdot \dfrac{0.622 \text{ euros}}{\$1.00}$

(4) $\dfrac{1.35 \text{ euros}}{1 \text{ L}} \cdot \dfrac{0.622 \text{ euros}}{\$1.00} \cdot \dfrac{0.264 \text{ gal}}{1 \text{ L}}$

25

The ordered pairs $(20, -29.5), (21, -31)$, and $(22, -32.5)$ are points on the graph of a linear equation.

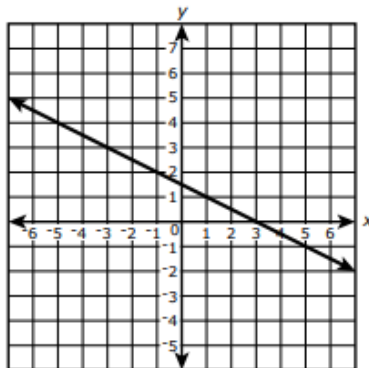Which of the following graphs shows **all** of the ordered pairs in the solution set of this linear equation?

A.
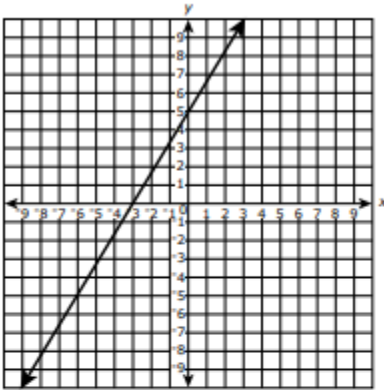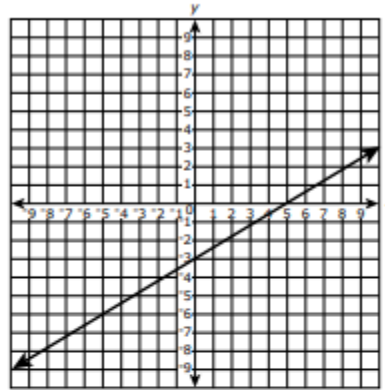

B.

C.

D.
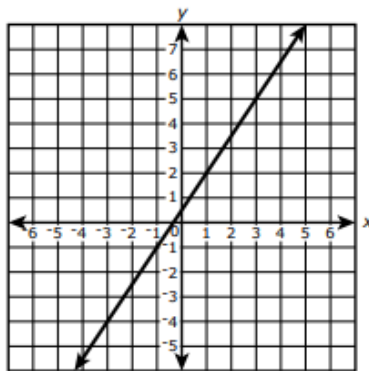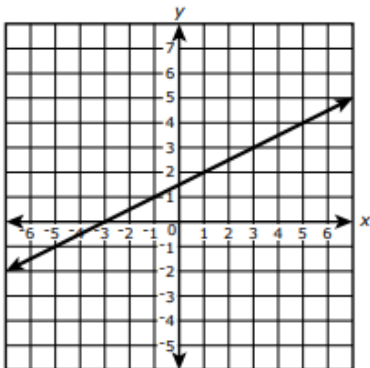
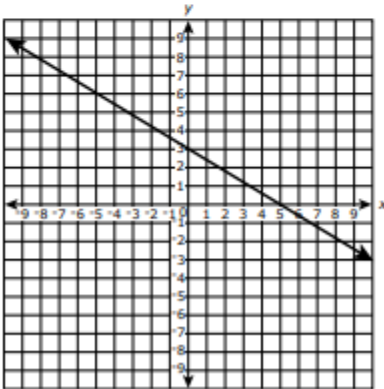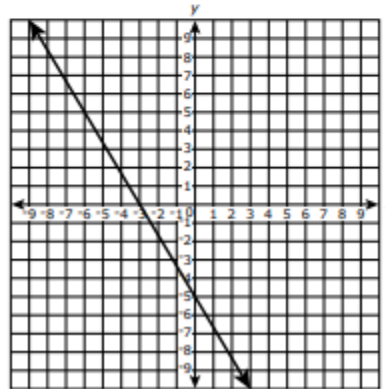Which graph represents the equation $5y - 3x = -15$?
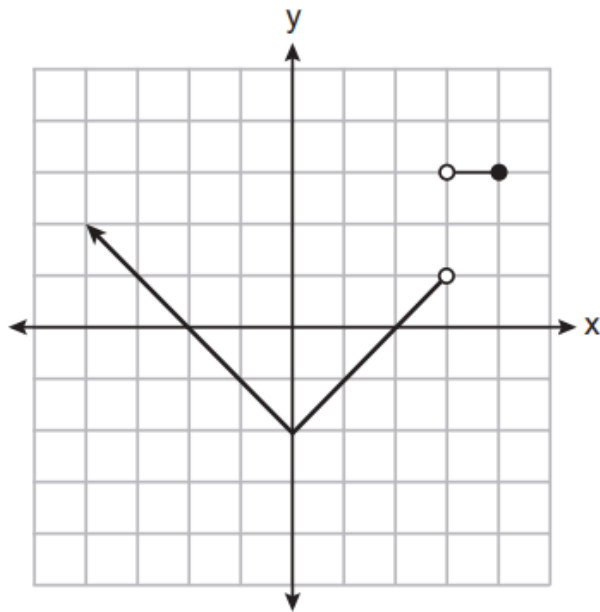
A.

B.

C.

D.

27

Classify the expression $\dfrac{2}{\sqrt{144}} + \dfrac{\sqrt{169}}{3}$ as rational or irrational. Explain your reasoning.

28.

Bryan said that the piecewise function graphed below has a domain of all real numbers.

State *two* reasons why Bryan is *incorrect*.