1. A relation contains the ordered pairs (3, 8), (6, 10), (9, 12), and (a, b). For which values of a and b is the relation a function?

   A. a = 3 and b = 14

   B. a = 6 and b = 12

   C. a = 9 and b = 9

   D. a = 11 and b = 8

2. Which relation below is a function?

   A. x y
      0 –2
      1 –3
      0 –4
      2 –5

   B. x y
      0 2
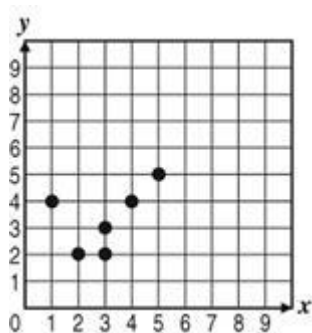   1 3
      0 4
      2 5

   C. x y
      0 0
      1 1
      0 8
      2 27

   D. x y
      0 0

1 –4

2 8

3 4

3. The graph below displays a relation between *x* and *y*.

This relation does NOT define *y* as a function of *x* because

A. the relation is not linear.

B. points (2, 2) and (3, 2) have the same *y*-value.

C. points (3, 2) and (3, 3) have the same *x*-value.

D. several points have equal *x*- and *y*-values.

4. In which set of ordered pairs, (*x*, *y*), is *y* NOT a function of *x*?

A. {(4, 3), (3, 4)}

B. {(4, 3), (7, 3)}

C. {(7, 4), (4, 7), (4, 3)}

D. {(7, 7), (4, 4), (3, 3)}

5. In which set of ordered pairs, (x, y), is yNOT a function of x?

   A. {(1, 4), (4, 1)}

   B. {(1, 4), (6, 4)}

   C. {(6,1),(1,6),(1,4)}

   D. {(6, 6), (1, 1), (4, 4)}

6. The ordered pairs (x, y) define the relation Q.

$${(4, 5), (-3, 2), (5, 5), (2, -3)}$$

   Is Q a function?

   A. Yes, because there is exactly one x-value for every y-value.

   B. Yes, because there is exactly one y-value for every x-value.

   C. No, because there is more than one x-value for some y-values.

   D. No, because there is more than one y-value for every x-value.

7. In which set of ordered pairs, (x, y), is yNOT a function of x?

   A. {(7, 10), (10, 7)}

B. {(7, 10), (5, 10)}

C. {(5, 7), (7, 5), (7, 10)}

D. {(5, 5), (7, 7), (10, 10)}

8. Which relation of *x* and *y* is a function?

A. *xy*
     0 –2
     1 –3
     0 –4
     2 –5

B. *xy*
     02
     13
     04
     25

C. *xy*
     00
     11
     08
     227

D. *xy*
     0 0
     1 –4
     3 2
     2 4

9. The following ordered pairs (*x, y*) define the relation Q. Is Q a function?

$$\{(3, -2), (-3, 1), (-2, -2), (1, -3)\}$$

   A. Yes, because there is exactly one *x*-value for every *y*-value.

   B. Yes, because there is exactly one *y*-value for every *x*-value.

   C. No, because there is more than one *x*-value for some *y*-values.

   D. No, because there is more than one *y*-value for every *x*-value.

10. The following ordered pairs (x, y) define the relation Q. Is Q a function?

$$\{(-2, 2), (-3, 0), (2, 2), (0, -3)\}$$

   A. Yes, because there is exactly one *x*-value for every *y*-value.

   B. Yes, because there is exactly one *y*-value for every *x*-value.

   C. No, because there is more than one *x*-value for some *y*-values.

   D. No, because there is more than one *y*-value for every *x*-value.

11. Which ordered pair (x, y) makes the relation a function?

$$\{(3, 4), (-2, 6), (5, 5), (-4, 6), (x, y)\}$$

A. (−4, 4)

B. (−2, 5)

C. (0, 6)

D. (3, 6)

12. Which ordered pair (*x, y*) makes the relation below a function?

$$\{(0,\ 1),\ (-2,\ 3),\ (2,\ 2),\ (-4,\ 3),\ (x,\ y)\}$$

A. (−4, 0)

B. (−2, 0)

C. (2, 0)

D. (4, 0)

13. The following ordered pairs (x, y) define the relation Q.

$$\{(0,\ 3),\ (-1,\ 4),\ (3,\ 3),\ (4,\ -1)\}$$

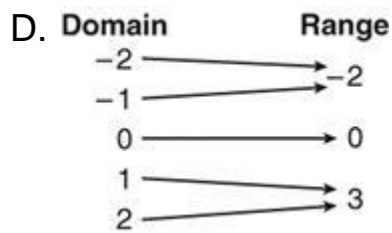Which sentence tells whether Q is a function and explains why or why not?
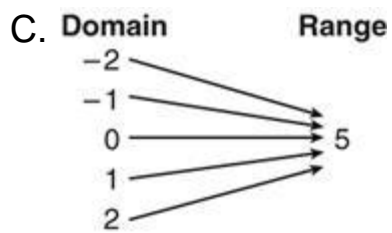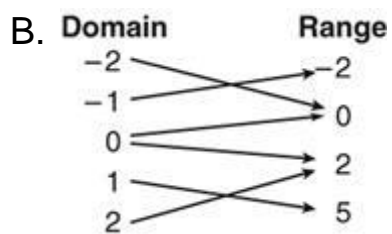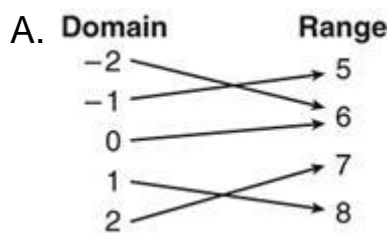
A. Yes, because there is exactly one *y*-value for every *x*-value.

B. Yes, because there is exactly one *x*-value for every *y*-value.

C. No, because there is more than one *y*-value for some *x*-values.

D. No, because there is more than one *x*-value for some *y*-values.

14. Which relation below is NOT a function?

A. **Domain**   **Range**
-2   5
-1   6
0   7
1
2   8

B. **Domain**   **Range**
-2   -2
-1   0
0
1   2
2   5

C. **Domain**   **Range**
-2
-1
0   5
1
2

D. **Domain**   **Range**
-2
-1   -2
0   0
1
2   3

15. Which ordered pair (*x, y*) makes the relation below a function?

$$\{(1, 2), (-2, 4), (3, 3), (-4, 4), (x, y)\}$$

A. $(-4, -2)$

B. $(-2, 3)$

C. $(3, 2)$

D. $(5, 1)$

16. The ordered pairs (x, y) define the relation Q. Is Q a function?

$$\{(2, -1), (-3, 4), (-1, -1), (4, -3)\}$$

A. Yes, because there is exactly one *y*-value for every *x*-value.

B. Yes, because there is exactly one *x*-value for every *y*-value.

C. No, because there is more than one *x*-value for some *y*-values.

D. No, because there is more than one *y*-value for every *x*-value.

17. Which ordered pair (x, y) makes this relation a function?

$$\{(5, 6), (-2, 8), (7, 7), (-4, 8), (x, y)\}$$

A. $(-3, 8)$

B. $(-2, 7)$

C. $(5, 7)$

D. $(7, 8)$

18. Which ordered pair (x, y) makes this relation a function?

$$\{(2, 3), (-2, 5), (4, 4), (-4, 5), (x, y)\}$$

A. $(-4, -1)$

B. $(-1, -1)$

C. $(-2, -1)$

D. $(2, -1)$

19. Which of the following sets of ordered pairs is a function?

A. $\{(0, 3), (0, 2), (0, 3)\}$

B. $\{(1, 0), (2, 0), (3, 0)\}$

C. $\{(-3, 1), (-2, 0), (-3, -2)\}$

D. $\{(-5, -4), (-5, -2), (-5, 0)\}$

20. The following ordered pairs (x, y) define the relation Q. Is Q a function?

$$\{(-2, 1), (-1, 2), (1, 1), (2, -1)\}$$

A. Yes, because there is exactly one y-value for every x-value.

B. Yes, because there is exactly one x-value for every y-value.

C. No, because there is more than one x-value for some y-values.

D. No, because there is more than one y-value for every x-value.

21. Which relation is a function?

A.

x	y
0	-3
1	-4
0	-5
2	-6

B.

x	y
0	3
1	4
0	5
2	6

C.

x	y
0	0

1	1
0	8
2	27

D.

x	y
0	0
1	5
4	5
2	–5

22. The following ordered pairs (x,y) define the relation Q.

$$Q = \{(-1,4),(-2,3),(4,4),(2,-2)\}$$

Is Q a function?

A. Yes, because there is exactly one y-value for every x-value.

B. Yes, because there is exactly one x-value for every y-value.

C. No, because there is more than one x-value for some y-values.

D. No, because there is more than one y-value for every x-value.

23. Which ordered pair (x, y) could NOT be substituted in the relation below so that the relation is a function?

$$\{(6, 7), (-2, 9), (8, 8), (-4, 9), (x, y)\}$$

A. (2, 9)

B. (7, 8)

C. (8, 3)

D. (9, 9)

24. The following ordered pairs (x, y) define the relation Q. Is Q a function?

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

A. Yes, because there is exactly one x-value for every y-value.

B. Yes, because there is exactly one y-value for every x-value.

C. No, because there is more than one x-value for some y-values.

D. No, because there is more than one y-value for every x-value.

25. Which ordered pair (x, y) could be substituted in the relation so that the relation is a function?

$$\{(4, 5), (-2, 7), (6, 6), (-4, 7), (x, y)\}$$

A. (-4, 3)

B. (-3, 0)

C. $(4, -1)$

D. $(6, -2)$

26. Which of the following does NOT represent a function of x ?

A.

x	y
-4	2
0	-3
2	5
4	-3

B.

x	y
-1	-6
1	-6
3	4
6	7

C.

x	y
-1	3
-1	5
2	6
3	4

D.

x	y
-1	2
2	5
3	4
4	-3

27. Which value of k will allow the following set of ordered pairs to represent a function?

$$\{(3, 7), (2, 6), (k, 8), (1, 5)\}$$

A. 1

B. 2

C. 3

D. 5

28. Which of the following sets of ordered pairs represents a function?

A. {(0, 0), (0, 1) , (0, 2), (0, 3)}

B. {(0, 0), (1, 1), (1, − 1), (4, 2)}

C. {(0, 2), (1, 2), (2, 2), (3, 2)}

D. {(1, 2), (3, 4), (1, 4), (3, 2)}

29. Which of the following relations does NOT represent a function of x?

A.
x	y
0	1
1	2
2	1
3	2

B.
x	y
1	5
2	5
3	5
4	5

C.
x	y
1	3
5	3
5	4
7	4

D.

x	y
2	8
4	6
6	4
8	2

30. Which of the following relations is a function?

A.

x	y
1	3
1	4
3	5
5	6

B.

x	y
0	1
2	4
4	4
6	1

C.

x	y

2	3
2	5
2	6
2	8

D.

x	y
3	1
6	2
8	3
8	4

31. Which of the following relations is NOT a function?

A. {(0, 1), (1, 1), (2, 1), (3, 1)}

B. {(0, 1), (0, 2), (0, 3), (0, 4)}

C. {(0, 0), (3, 4), (5, 6), (8, 9)}

D. {(0, 0), (2, 2), (4, 4), (6, 6)}

32. Which ordered pair can be substituted for (x, y) to ensure that the relation
    $\{(3, 0), (1, 4), (5, 9), (2, 8), (x, y)\}$ is a function?

    A. (0, 0)

    B. (1, 5)

    C. (2, 7)

    D. (3, 3)

33. Which chart represents a function?

    A.
x	y
0	0
1	-1
1	1
4	2

    B.
x	y
2	6
4	10
6	14
8	18

    C.
x	y
-2	2
2	-3
2	2
3	-3

D.

x	y
3	2
3	-2
5	24
-5	24

34. Which of the following charts represents a function?

A.

x	y
2	3
3	4.5
5	7.5
10	15

B.

x	y
-2	5
-2	2
0	1
2	5

C.

x	y
1	3
− 1	− 3
1	− 3
-1	3

D.

x	y

−2	−3
−2	1
0	−1
0	1

35. The sets of ordered pairs below represent relations.

I	{(0, 0), (1, 1), (2, 2), (3, 3), (4, 4)}
II	{(1, 2), (2, 1), (1, 3), (0, 1), (3, 1)}
III	{(0, 2), (1, 2), (2, 4), (3, 4), (3, 6)}
IV	{(1, 6), (2, 6), (3, 6), (4, 6), (5, 6)}

Which of these sets are also functions?

A. I only

B. I and IV

C. II and III

D. II, III, and IV

36.

Which ordered pair is a solution to the function $y = \frac{1}{3}x - 5$?

A. (−5, 3)

B. (−4, 3)

C. (3, −5)

D. (3, −4)

37. Mary earns $7.25 an hour. She can determine her salary, *s*, for the number of hours she works, *h*, by using the equation *s* = 7.25*h*. Which statement explains why *s* is a function of *h*?

   A. For every value of *h* there is only one value of *s*.

   B. For some values of *h* there is more than one value of *s*.

   C. For some values of *s* there is more than one value of *h*.

   D. For every value of *s* there are two values of *h*.

38. A linear function is graphed on the coordinate plane below.
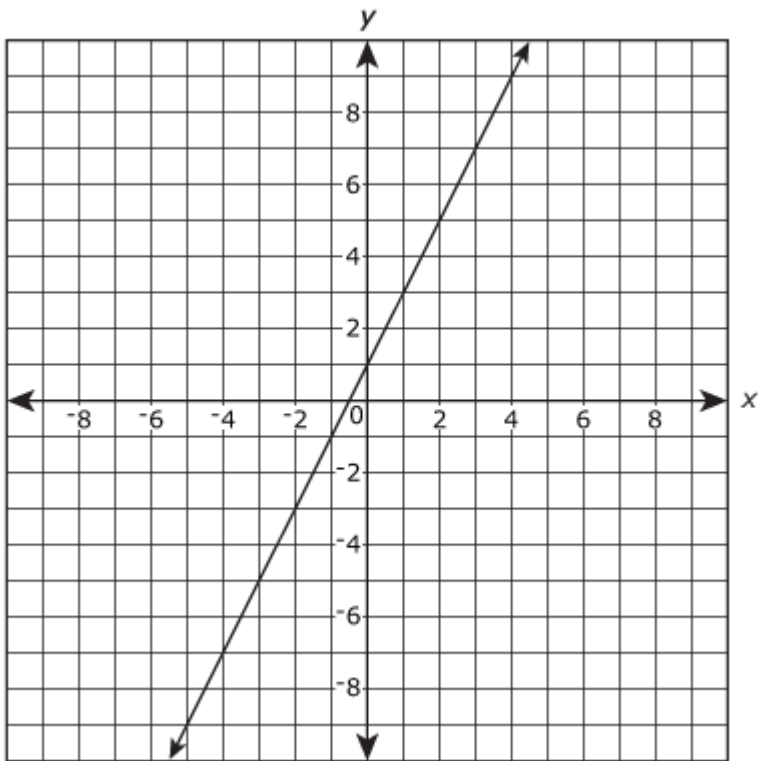
Which output value is associated with the input value of 4?

A. 1

B. 1.5

C. 2

D. 9

39. The relation shown is not a function.
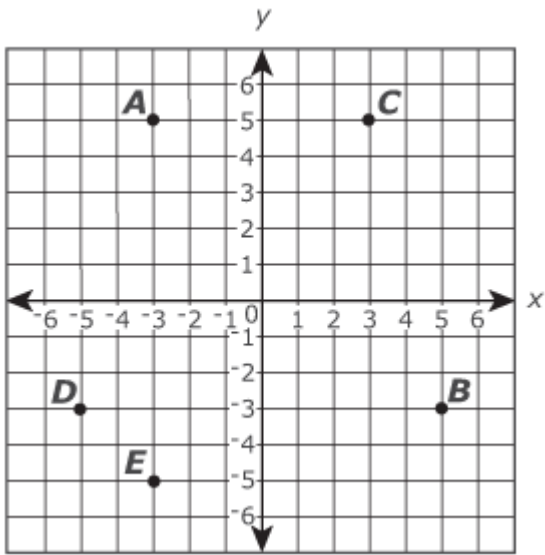
Which point should be removed to make the relation a function?

A. Point *A*

B. Point *B*

C. Point *C*

D. Point *D*

40. Which relation could also represent a function?

A. {(3, 4), (0, 1), (−1, − 2), (−2, − 1), (0, − 1)}

B. $y = x + 3$

C. **Input**   **Output**

D.
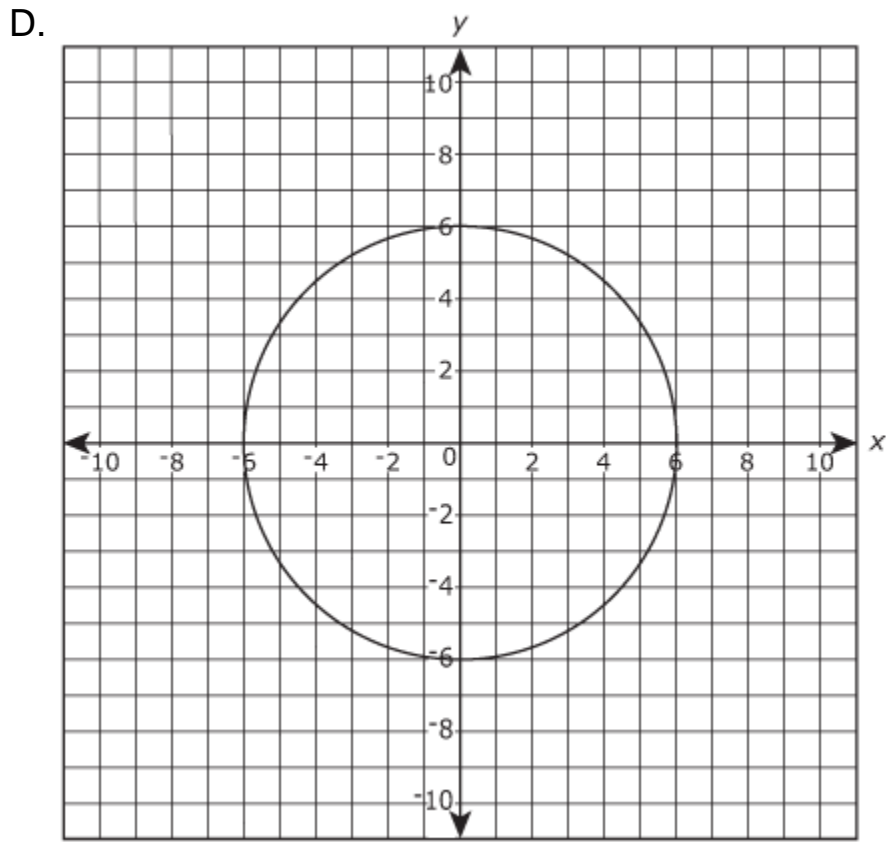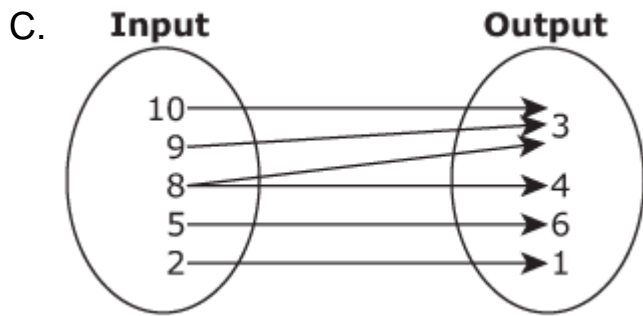
41. Which of the following relations is a function?

A. {(− 1, − 4), (− 1, 0), (− 1, 5), (− 1, 7), (− 1, 9)}

B. {(− 2, − 4), (− 1, 7), (1, − 1), (1, 1), (3, 9)}

C. {(− 4, 9), (− 3, 1), (− 2, 3), (− 2, 12), (0, 6)}

D. {(0, − 4), (1, − 4), (2, 4), (3, 4), (4, − 4)}

42. Which table represents a function?

A.

x	y
2	8
6	4
10	−14
2	−8

B.

x	y
12	20
10	14
12	18
4	8

C.

x	y
−14	−24
−8	−18
4	−18
10	10

D.

x	y
12	18
−15	9
18	10
−15	15

43. Which statement is true of table A and table B shown below?

TABLE A	
x	y
2	2
4	6
6	8
2	4

TABLE B	
x	y
9	3
12	3
15	3
18	3

A. Table A represents a function because there is only one output for each input value.

B. Table B represents a function because there is only one output for each input value.

C. Table A represents a function because there is only one input for each output value.

D. Table B represents a function because there is only one input for each output value.

44. Which of the equations shown below represents a function?

Equation 1 : $y = x^2 + 2x + 9$

Equation 2 : $x = 9 - y^2$

A. Only 1

B. Only 2

C. Both 1 and 2

D. Neither 1 nor 2

45. Which set of ordered pairs does NOT represent a function?

A. $\{(1, 2), (1, 3), (1, 4)\}$

B. $\{(2, 3), (3, 3), (4, 3)\}$

C. $\{(2, 2), (3, 3), (4, 4)\}$

D. $\{(0, 0), (1, 3), (2, 6)\}$

46. Sarah has been keeping track of how many hours she practices basketball each week and thinks that the percentage of free throws she makes during practice improves the more she practices. To check this, she makes a graph comparing the number of hours she practices each week with the percentage of free throws she makes each week. Based on what she learned in her Algebra class, she realizes that her graph represents a function. Which of these could be Sarah's graph?
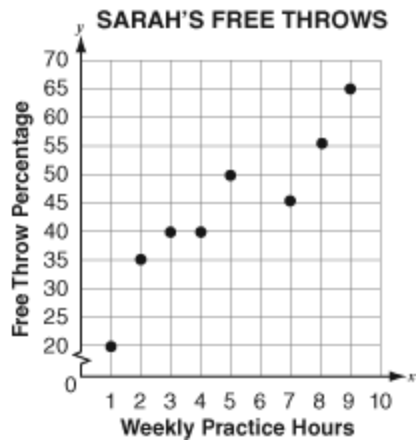
A.

SARAH'S FREE THROWS

B.

SARAH'S FREE THROWS

C.

SARAH'S FREE THROWS

D.

SARAH'S FREE THROWS
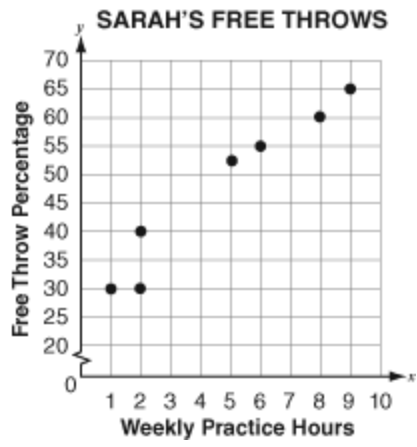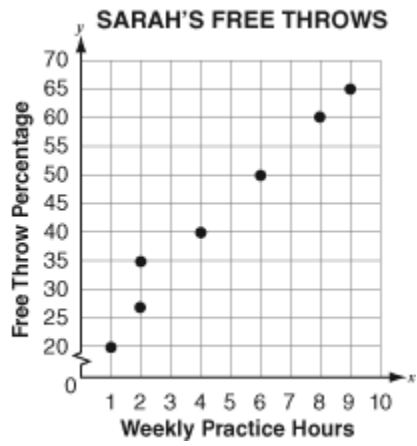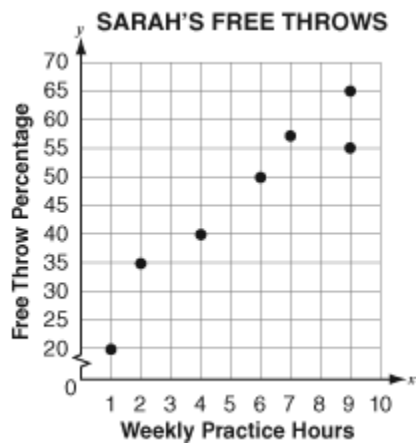
47. Which sets of ordered pairs below describe a function?

I. $\{(2, 3), (2, 4)\}$

II. $\{(0,2), (0, 3)\}$

III. $\{(3, 0.3), (-3, 0.3)\}$
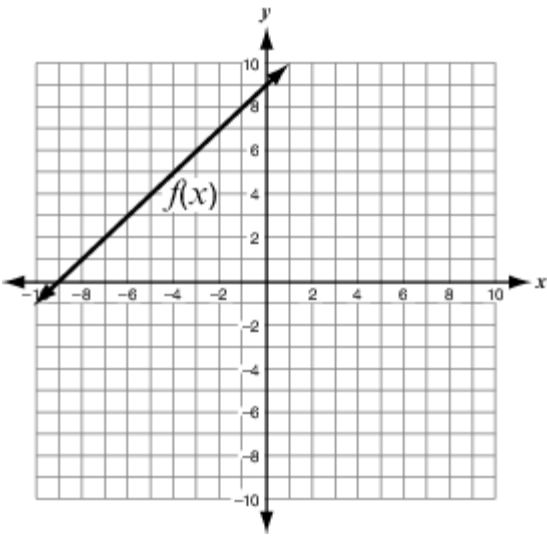
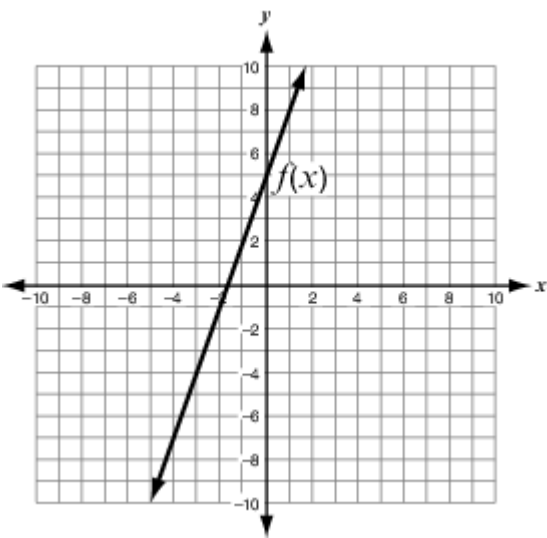IV. $\{(-2, 2), (2, -2)\}$

A. I and II

B. II and III

C. III and IV

D. IV and I

48. Which function would also include the ordered pairs $(2, 11), (3, 14), (4, 17),$ and $(5, 20)$?
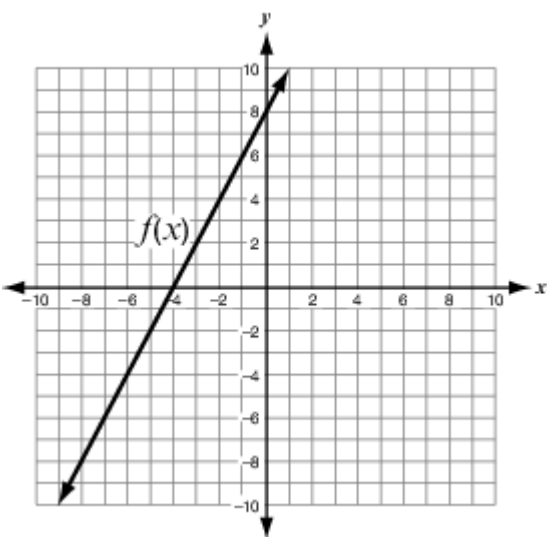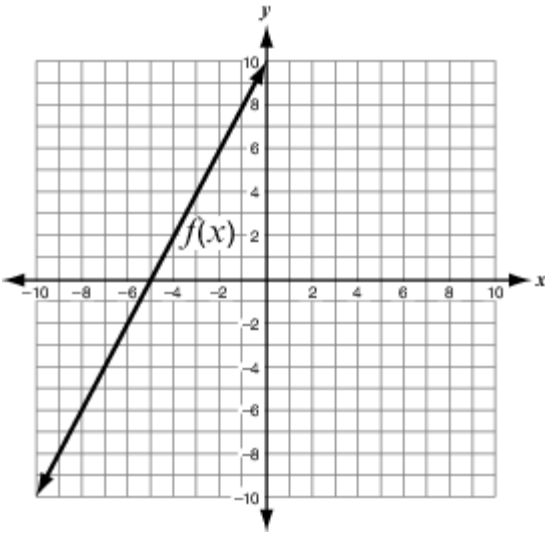
A.

B.

C.

D.

49. Which of the following relations is not a function?

A. $y = \dfrac{4}{1+x}$

B. $y = -2.7$

C. $y = \begin{cases} x-1, & x \le 0 \\ x+1, & x \ge 0 \end{cases}$

D. $y = \sqrt{x-3}$

50. Viola graphed the function $f(x) = 3x - 12$ on a coordinate plane. Which statement about this graph is true of all functions?

A. It is a linear graph.

B. It has a positive correlation.

C. It assigns a specific input to each output.

D. It assigns a unique output to each input.

51. Which of these relations is NOT a function?

A. $R = \{(0, 0), (2, 6), (-4, -12), (-5, -15)\}$

B. $R = \{(-2, 2), (2, -2), (-4, 4), (4, -4)\}$

C. $R = \{(4, 5), (4, 8), (5, 10), (6, 12)\}$

D. $R = \{(2, 3), (4, 3), (6, 3), (5, 3)\}$

52. The Juice Cafe posted the sign below showing the prices of smoothies of various sizes.

SMOOTHIE PRICES

Size	Price
8 ounce	$2.29
12 ounce	$2.79
12 ounce	$3.09
16 ounce	$3.69
20 ounce	$4.09
22 ounce (bonus size)	$4.09

Which change would make the price of smoothies a function of the size?

A. change the smoothie prices so that each interval between prices is $0.50

B. change the first 12-ounce smoothie to a 10-ounce smoothie so that each smoothie size has only one price

C. change the price of the 22-ounce smoothie to $4.29 so that each price is assigned to only one smoothie size

D. change the 22-ounce smoothie to a 24-ounce smoothie so that each interval between smoothie sizes is 4 ounces