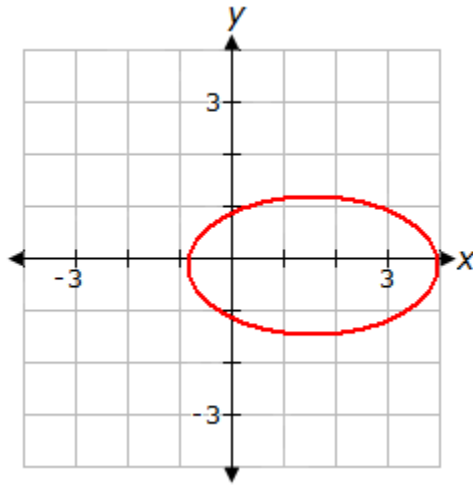


RELATIONS & FUNCTIONS Worksheet

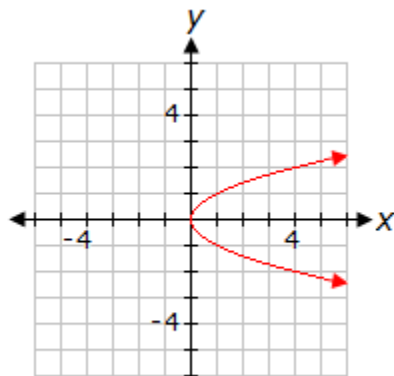
1.



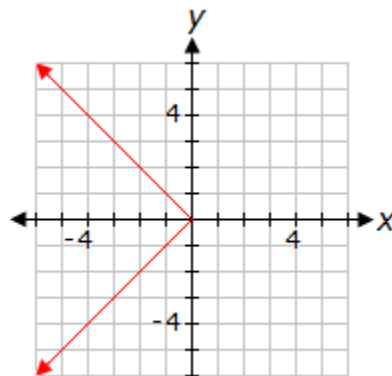
Using the vertical line test, determine if the graph above shows a relation, a function, both a relation and a function, or neither a relation nor a function.

- A. neither a relation nor a function
- B. relation only
- C. both a relation and a function
- D. function only

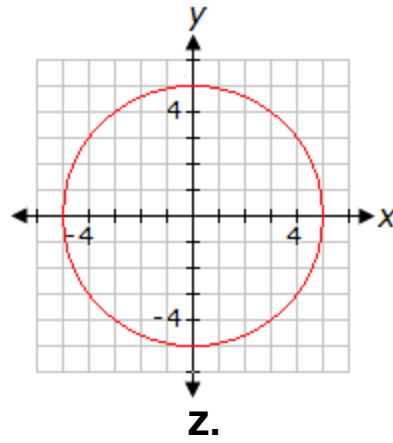
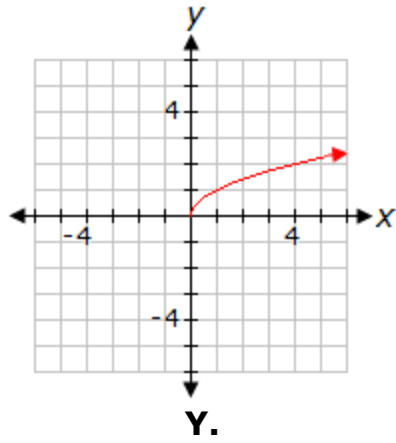
2. Which of these graphs represents a function?



W.



X.



- A. Z
- B. X
- C. W
- D. Y

3. Which of these t-tables represents a function?

x	$f(x)$
5	-1
3	0
5	1
7	2

W.

x	$f(x)$
2	-2
0	0
2	2
8	4

X.

x	$f(x)$
-2	0
0	2
2	0
1	1.7

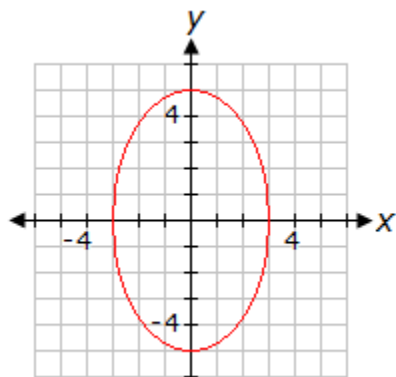
Y.

x	$f(x)$
-2	0
0	2
2	0
0	-2

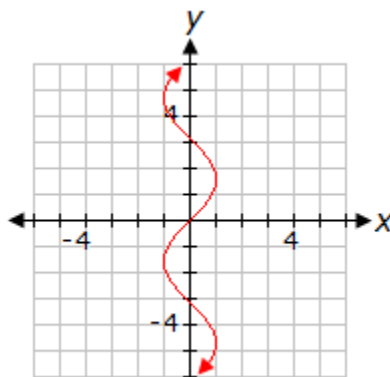
Z.

- A. W
- B. Y
- C. Z
- D. X

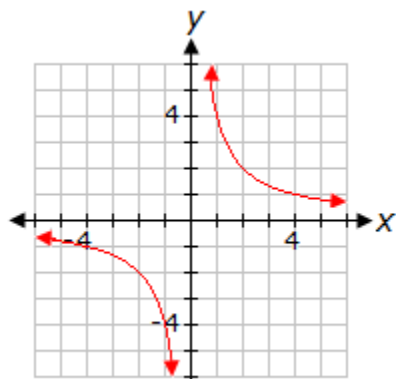
4. Which of these graphs represents a function?



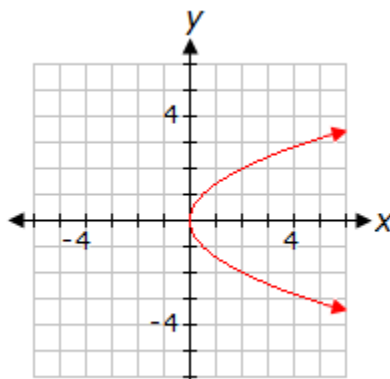
W.



X.



Y.



Z.

- A. Z
 - B. W
 - C. X
 - D. Y
-

5. Which of the following relations describes a function?

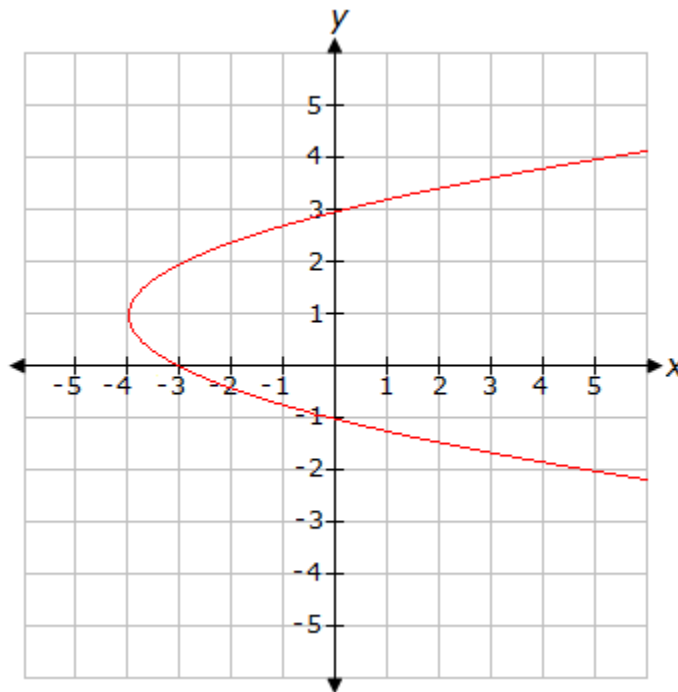
- A. $\{ (0, 0), (0, 2), (2, 0), (2, 2) \}$
 - B. $\{ (2, 2), (2, 3), (3, 2), (3, 3) \}$
 - C. $\{ (2, -1), (2, 1), (3, -1), (3, 1) \}$
 - D. $\{ (-2, -3), (-3, -2), (2, 3), (3, 2) \}$
-

6. Do the ordered pairs below represent a relation, a function, both a relation and a function, or neither a relation nor a function?

$(-2,-1)$, $(1,-4)$, $(7,-10)$, $(8,-11)$

- A. neither a relation nor a function
 - B. both a relation and a function
 - C. relation only
 - D. function only
-

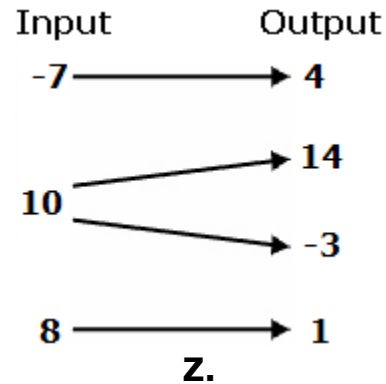
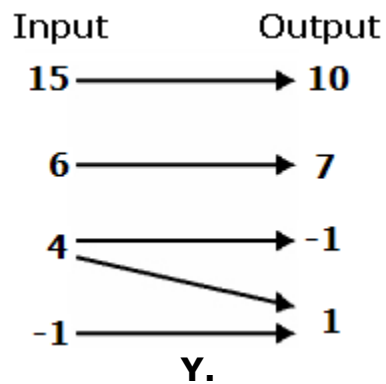
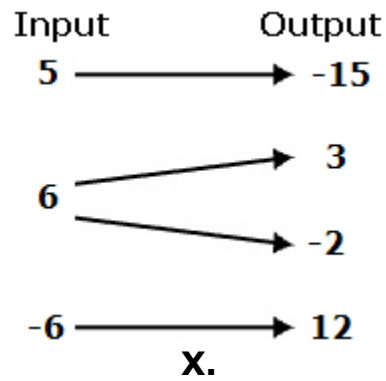
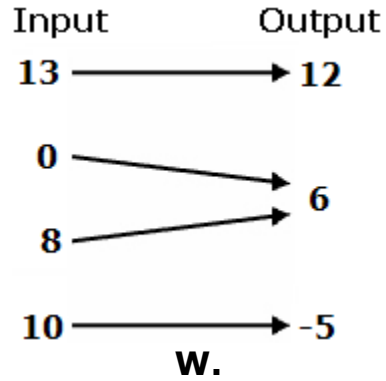
7.



Determine whether this picture is an example of a function, relation, function and relation, or neither relation nor function.

- A. function and relation
 - B. function only
 - C. relation only
 - D. neither function nor relation
-

8. Which relation diagram represents a function?

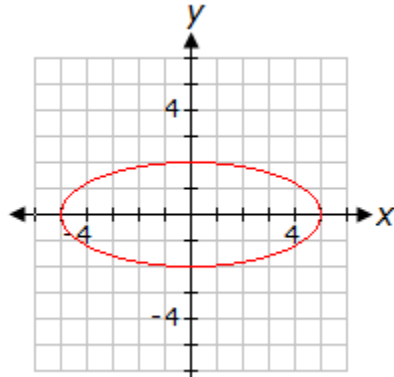


- A. Z
 - B. X
 - C. W
 - D. Y
-

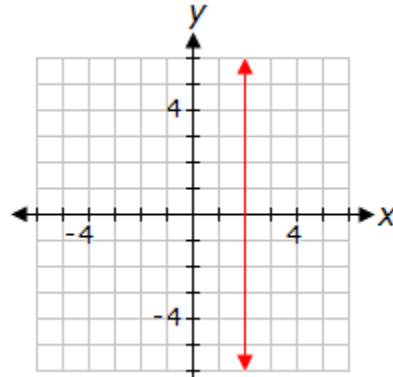
9. Which of the following relations describes a function?

- A. $\{ (2, 2), (3, 2), (4, 2), (5, 2) \}$
 - B. $\{ (-2, 0), (0, -2), (0, 2), (2, 0) \}$
 - C. $\{ (0, 0), (2, -2), (2, 2), (3, 3) \}$
 - D. $\{ (2, 3), (2, 4), (2, 5), (2, 6) \}$
-

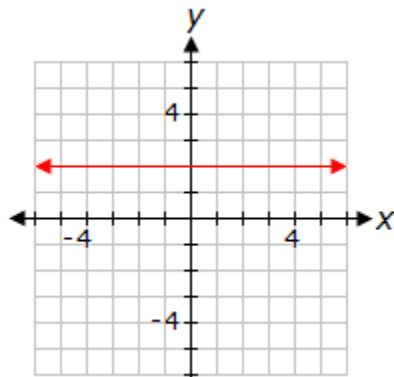
10. Which of these graphs represents a function?



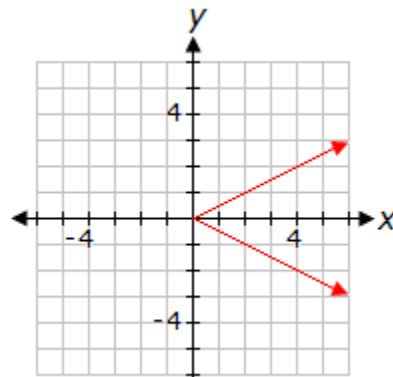
W.



X.



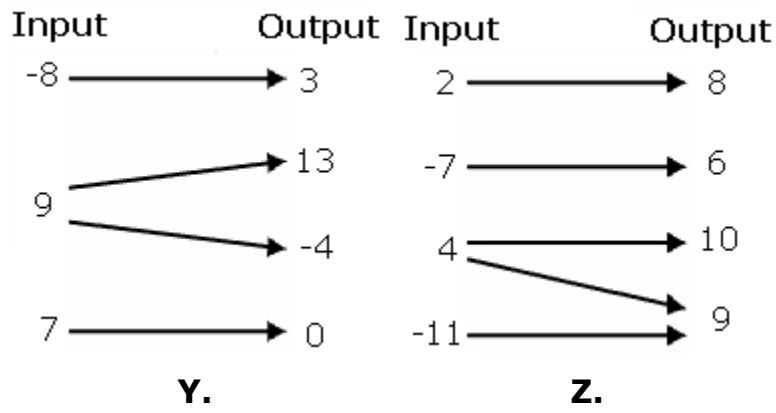
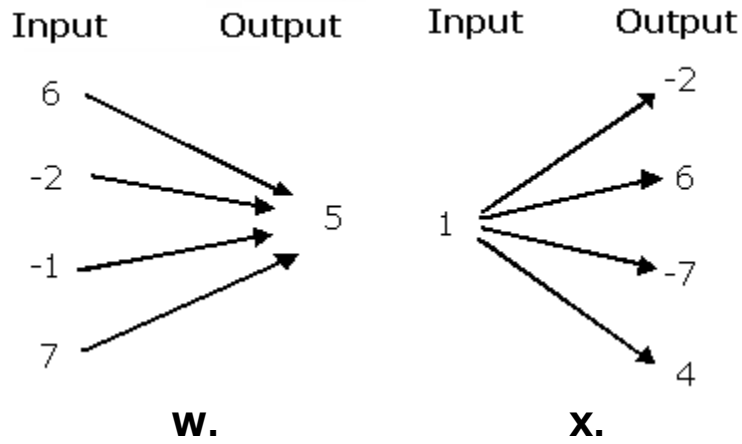
Y.



Z.

- A. Y
 - B. X
 - C. Z
 - D. W
-

11. Which relation diagram represents a function?

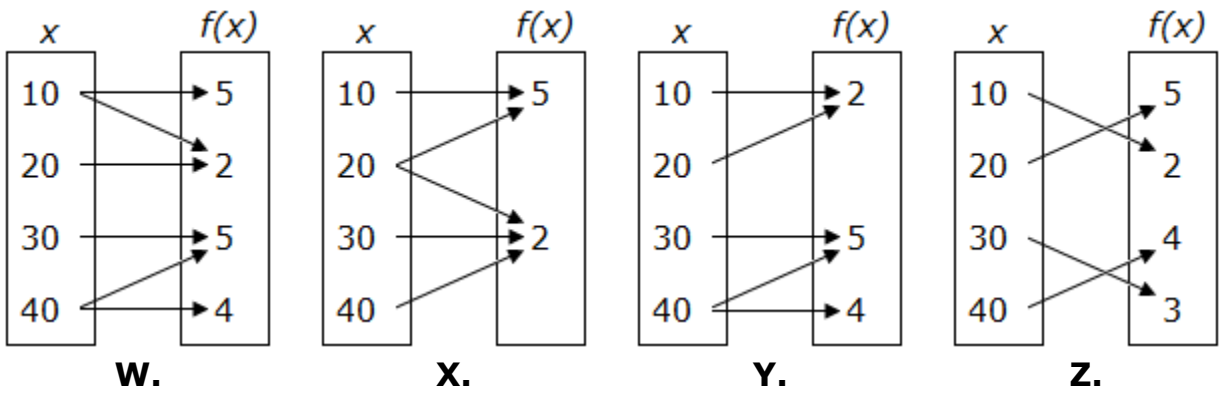


- A. W
 - B. X
 - C. Y
 - D. Z
-

12. Which of the following relations describes a function?

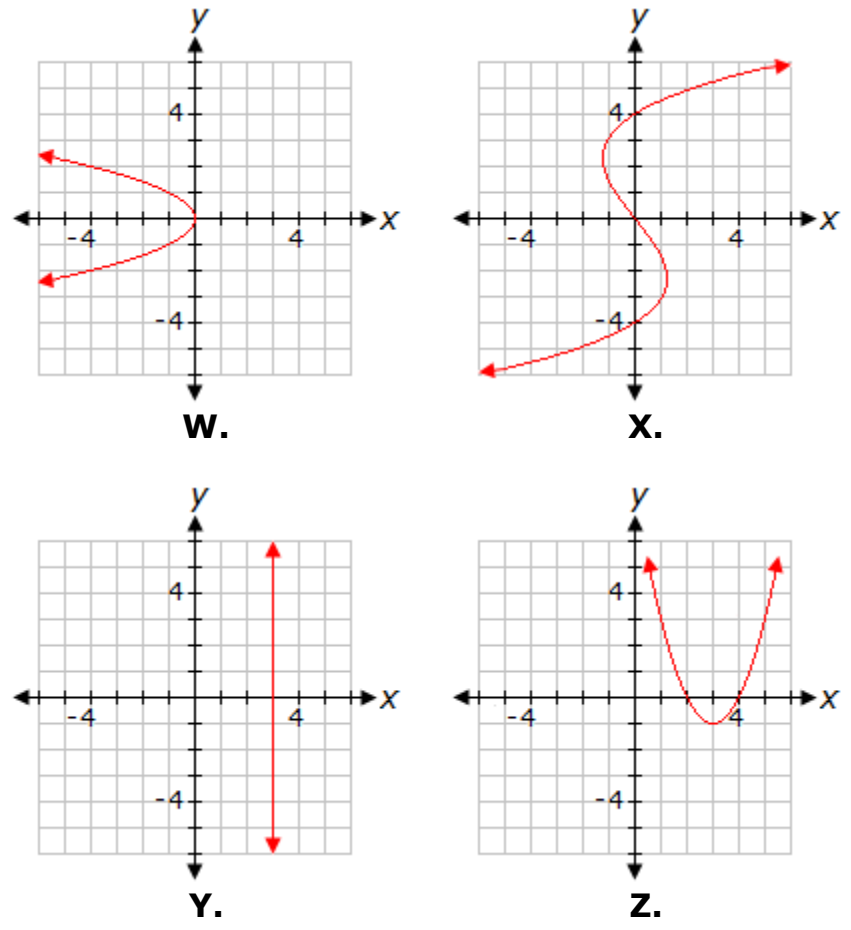
- A. $\{ (0, 0), (1, -1), (1, 1), (2, 2) \}$
 - B. $\{ (-2, 2), (-1, -1), (-1, 1), (0, 0) \}$
 - C. $\{ (-1, 0), (0, 1), (1, 0), (0, -1) \}$
 - D. $\{ (-2, 2), (-1, 1), (1, 1), (2, 2) \}$
-

13. Which of these mappings is a function?



- A. W
- B. Z
- C. X
- D. Y

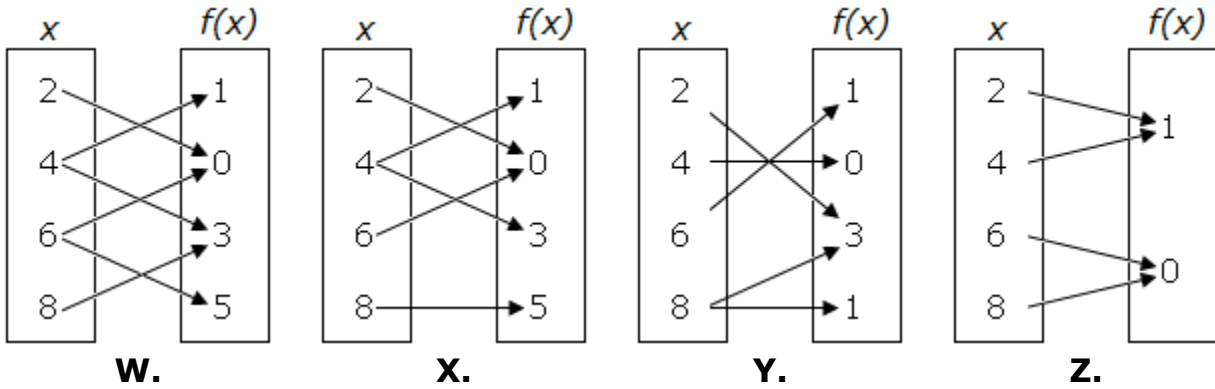
14. Which of these graphs represents a function?



- A. X

- B. W
- C. Y
- D. Z

15. Which of these mappings is a function?



- A. W
- B. Y
- C. X
- D. Z

16. Which of the following represents a relation and not a function?

- A.

x	-10	-6	-10	1
y	34	32	40	34
- B.

x	-10	-6	-2	1
y	34	32	40	34
- C.

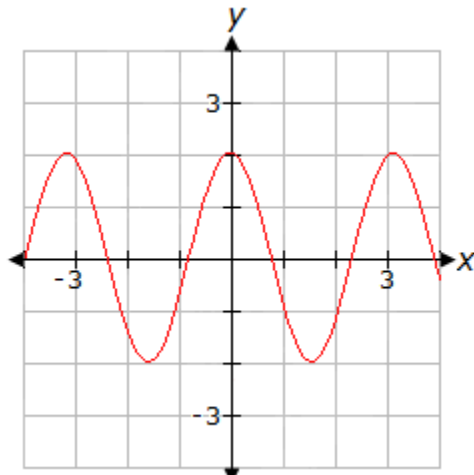
x	-10	-6	6	12
y	34	32	40	34
- D.

x	6	-6	12	-10
y	34	32	40	34

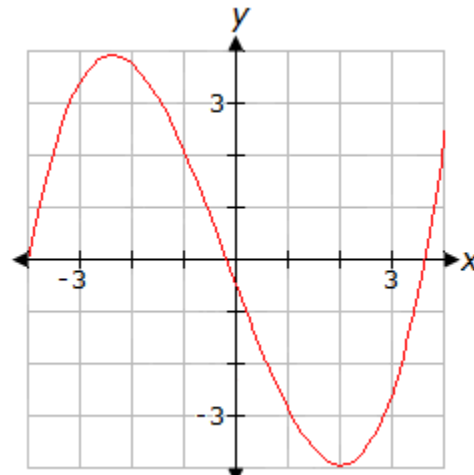
17. Think about the vertical line test and answer the following question. Would a vertical line be a relation, a function, both a relation and a function, or neither a relation nor a function?

- A. function only
 - B. both a relation and a function
 - C. neither a relation nor a function
 - D. relation only
-

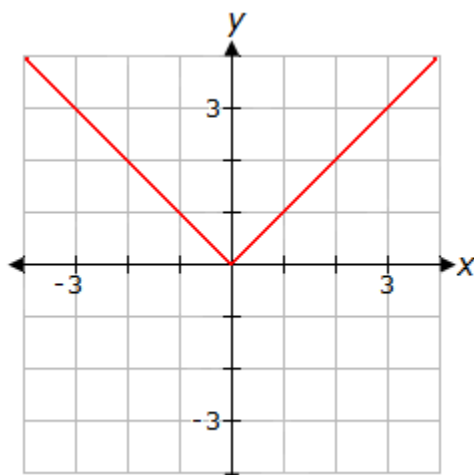
18. Which of the following graphs is not a function?



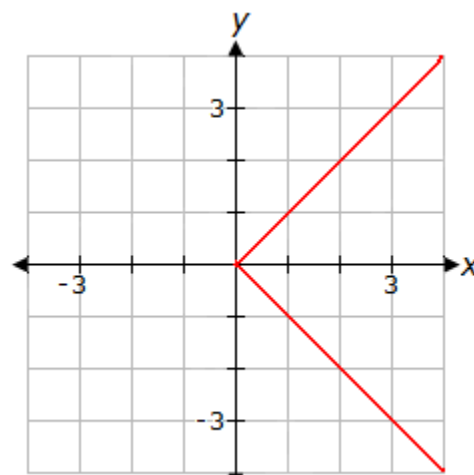
W.



X.



Y.



Z.

- A. Y
 - B. W
 - C. Z
 - D. X
-

19. Which of these t-tables represents a function?

x	$f(x)$
-2	0
0	1
2	0
0	-1

W.

x	$f(x)$
-4	2
-1	-1
0	0
-1	1

X.

x	$f(x)$
-1	-1
0	0
1	1
2	8

Y.

x	$f(x)$
-4	2
-2	-1
0	0
-2	1

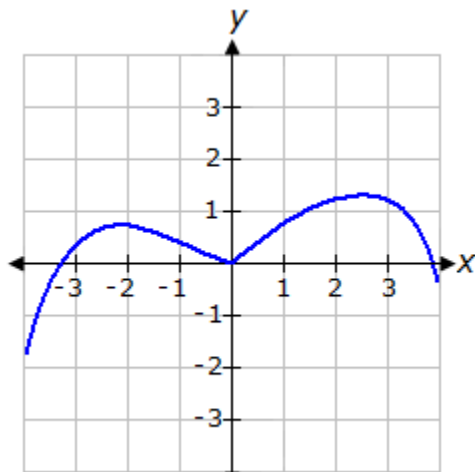
Z.

- A. X
 - B. Z
 - C. Y
 - D. W
-

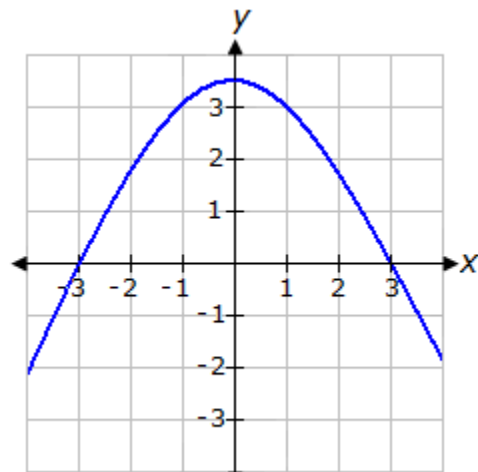
20. Which of the following relations describes a function?

- A. $\{ (-3, 9), (-2, 4), (2, 4), (3, 9) \}$
 - B. $\{ (2, -2), (0, 0), (2, 2), (3, 3) \}$
 - C. $\{ (-2, 0), (0, 2), (2, 0), (0, -2) \}$
 - D. $\{ (9, -3), (4, -2), (4, 2), (9, 3) \}$
-

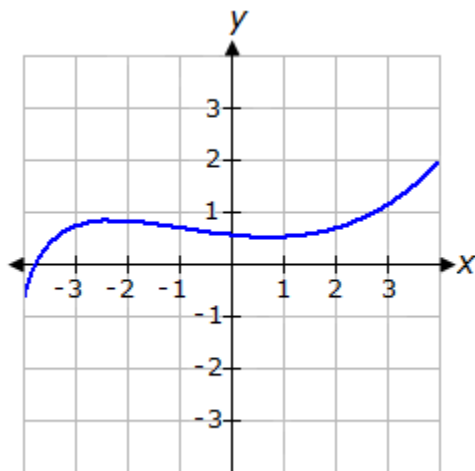
21. Which of the following graphs is not a function?



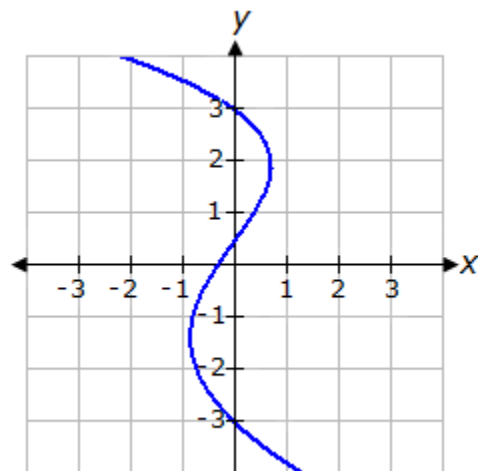
W.



X.



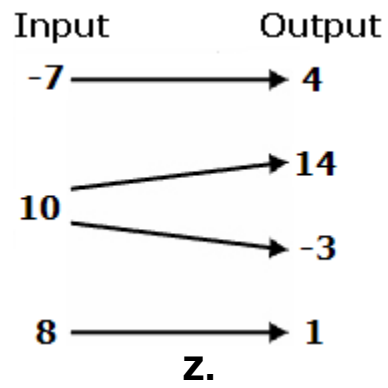
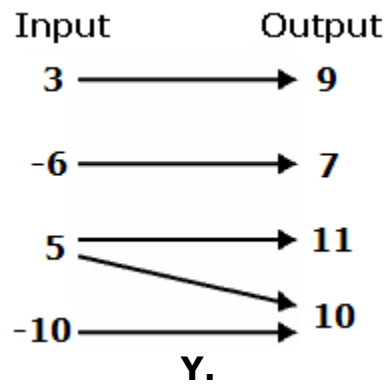
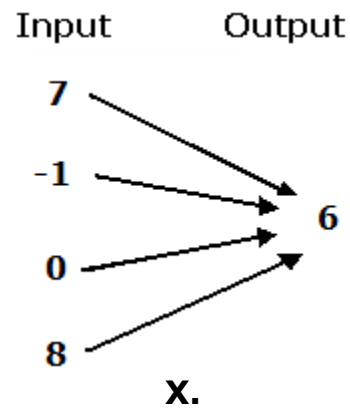
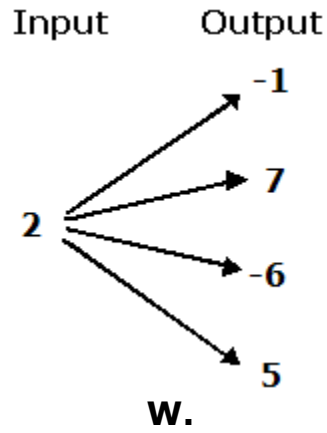
Y.



Z.

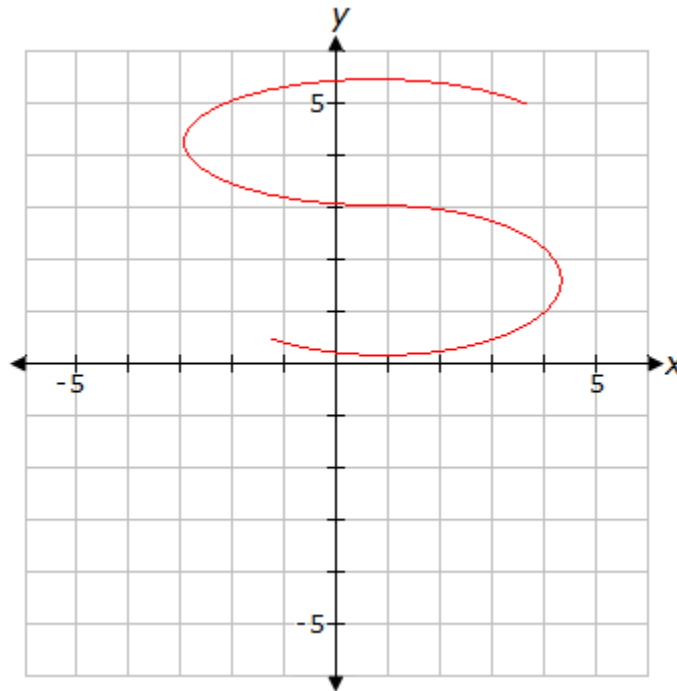
- A. W, X, Y and Z
 - B. Z
 - C. Y and Z
 - D. X and Y
-

22. Which relation diagram represents a function?



- A. Y
 - B. W
 - C. Z
 - D. X
-

23.



Determine whether this picture is an example of a function, relation, function and relation, or neither relation nor function.

- A. neither function nor relation
 - B. relation only
 - C. function only
 - D. function and relation
-

24. Do the ordered pairs below represent a relation, a function, both a relation and a function, or neither a relation nor a function?

$(-4, -3), (1, -8), (-4, -14), (9, -16)$

- A. function only
 - B. both a relation and a function
 - C. neither a relation nor a function
 - D. relation only
-

25. Which of these t-tables represents a function?

x	$f(x)$	x	$f(x)$	x	$f(x)$	x	$f(x)$
0	-1	-1	0	-1	3	3	-1
-1	0	0	1	0	1	1	0
0	1	1	0	1	3	3	1
3	2	0	-1	2	5	5	2
W.		X.		Y.		Z.	

- A. Y
 - B. Z
 - C. X
 - D. W
-

Answers

1. B
2. D
3. B
4. D
5. D
6. B
7. C
8. C
9. A
10. A
11. A
12. D
13. B
14. D
15. D
16. A
17. D
18. C
19. C
20. A
21. B
22. D
23. B

24. D

25. A

Explanations

1. A *relation* is a set of one or more ordered pairs.

A *function* is a relation in which each element of the domain is paired with EXACTLY one element of the range.

The Vertical Line Test: Given the graph of a relation, if a vertical line can be drawn that crosses the graph in more than one place, then the relation is not a function.

The graph does not pass the vertical line test; therefore, the graph is not a function, and it is a **relation only**.

2. Use the vertical line test to determine if the graphs represent a function.

The only graph given that passes the vertical line test is **Y**.

3. A function maps each domain element to only one range element.

The t-table **Y** is the only table that does not show a domain element paired with two or more range elements.

4. Use the vertical line test to determine if the graphs represent a function.

The only graph given that passes the vertical line test is **Y**.

5. A function is a set of ordered pairs such that for each domain element there is only one range element.

The set of ordered pairs $\{ (-2, -3), (-3, -2), (2, 3), (3, 2) \}$ is the only set that does not pair a domain element with two or more range elements.

6. A *relation* is a set of one or more ordered pairs.

A *function* is a relation in which each element of the domain is paired with EXACTLY one element of the range.

In this case, there is one y -coordinate for every x -coordinate.

The vertical line test can be used to determine this.

Therefore, it is **both a relation and a function**.

7. A *relation* is a set of one or more ordered pairs.

A *function* is a relation in which each element of the domain is paired with EXACTLY one element of the range.

The Vertical-Line Test: Given the graph of a relation, if a vertical line can be drawn that does not cross the graph in more than one place, it is a function.

Any vertical line drawn where $x > -4$ will cross the graph in more than one place.

Therefore, the graph is not a function, it is a **relation only**.

8. For a relation to be a function, each input value can only correspond to one output value. The relation diagram where each input value has exactly one arrow drawn to an output value will represent a function.

Therefore, diagram **W** represents a function.

9. A function is a set of ordered pairs such that for each domain element there is only one range element.

The set of ordered pairs $\{ (2, 2), (3, 2), (4, 2), (5, 2) \}$ is the only set that does not pair a domain element with two or more range elements.

10. Use the vertical line test to determine if the graphs represent a function.

The only graph given that passes the vertical line test is **Y**.

11. For a relation to be a function, each input value can only correspond to one output value. The relation diagram where each input value has exactly one arrow drawn to an output value will represent a function.

Therefore, diagram **W** represents a function.

12. A function is a set of ordered pairs such that for each domain element there is only one range element.

The set of ordered pairs $\{ (-2, 2), (-1, 1), (1, 1), (2, 2) \}$ is the only set that does not pair a domain element with two or more range elements.

13. A function maps each domain element to only one range element.

The only mapping that does not map a domain element to two or more range elements is **Z**.

14. Use the vertical line test to determine if the graphs represent a function.

The only graph given that passes the vertical line test is **Z**.

15. A function maps each domain element to only one range element.

The only mapping that does not map a domain element to two or more range elements is **Z**.

16. A *relation* is a set of one or more ordered pairs.

A *function* is a relation in which each element of the domain is paired with EXACTLY one element of the range.

In the table below, there are two y -coordinates for the x -coordinate -10 . Therefore, it is a relation only and not a function.

x	-10	-6	-10	1
y	34	32	40	34

17. A *relation* is a set of one or more ordered pairs.

A *function* is a relation in which each element of the domain is paired with EXACTLY one element of the range.

The Vertical-Line Test: Given the graph of a relation, if a vertical line can be drawn that does not cross any of the graphs in more than one place, it is a function.

If the relation being tested is a vertical line, then any x in the domain of the relation (which there would be only one) will correspond with every y of the range (an infinite number of points).

So, a vertical line can be drawn that crosses the graph in more than one place (the vertical line itself).

Therefore, a vertical line is not a function, and it is a **relation only**.

18. A *relation* is a set of one or more ordered pairs.

A *function* is a relation in which each element of the domain is paired with EXACTLY one element of the range.

The Vertical Line Test: Given the graph of a relation, if a vertical line can be drawn that crosses the graph in more than one place, then the relation is not a function.

Therefore, graph **Z** is not a function.

19. A function maps each domain element to only one range element.

The t-table **Y** is the only table that does not show a domain element paired with two or more range elements.

20. A function is a set of ordered pairs such that for each domain element there is only one range element.

The set of ordered pairs $\{ (-3, 9), (-2, 4), (2, 4), (3, 9) \}$ is the only set that does not pair a domain element with two or more range elements.

21. A *relation* is a set of one or more ordered pairs.

A *function* is a relation in which each element of the domain is paired with EXACTLY one element of the range.

The Vertical-Line Test: Given the graph of a relation, if a vertical line can be drawn that does not cross any of the graphs in more than one place, it is a function.

Therefore, **Z** is not a function.

22. For a relation to be a function, each input value can only correspond to one output value. The relation diagram where each input value has exactly one arrow drawn to an output value will represent a function.

Therefore, diagram **X** represents a function.

23. A *relation* is a set of one or more ordered pairs.

A *function* is a relation in which each element of the domain is paired with EXACTLY one element of the range.

The Vertical Line Test: Given the graph of a relation, if a vertical line can be drawn that crosses the graph in more than one place, then the relation is not a function.

Since the graph does not pass the vertical line test, it is not a function, it is a **relation only**.

24. A *relation* is a set of one or more ordered pairs.

A *function* is a relation in which each element of the domain is paired with EXACTLY one element of the range.

There are two y-coordinates (range element) when $x = -4$.

Therefore, it is a **relation only**.

25. A function maps each domain element to only one range element.

The t-table **Y** is the only table that does not show a domain element paired with two or more range elements.