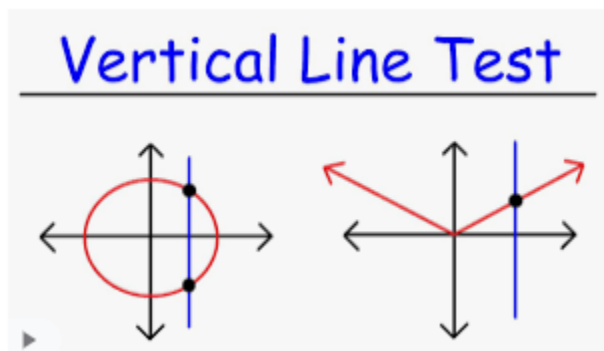
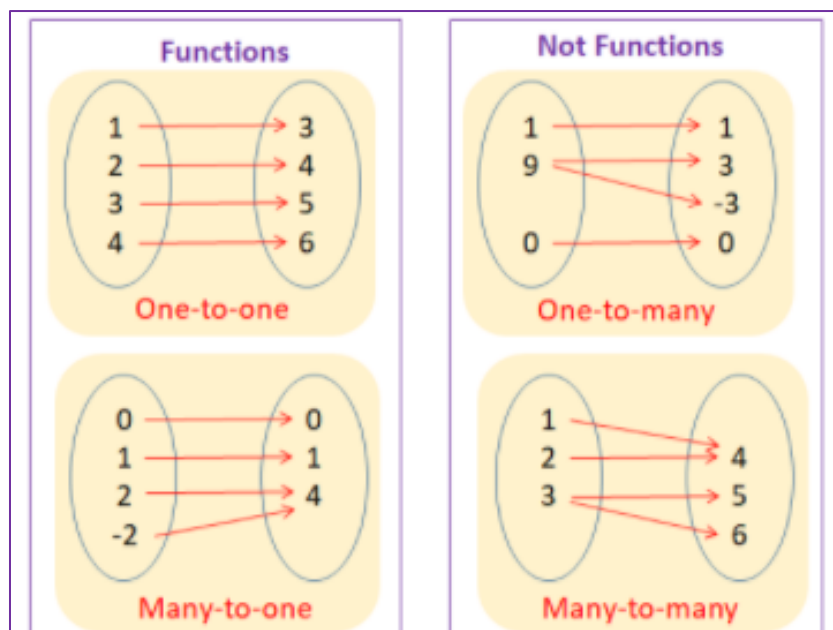


Relations and Functions

Find the Domain and Range

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

Domain: $\{0,3,-3,2\}$ Range: $\{2,4,-2\}$



Circle is not a function because you can draw a vertical line and touch the graph in more than one point

- 1) List the domain and range of the relation.

$$\{(3, -3), (7, 7), (0, -3), (7, 1), (3, 3)\}$$

The domain is $\{0, 3, 7\}$. (Domain are all x-values

Range are all y-values

The range is $\{-3, 1, 3, 7\}$ Don't duplicate numbers and put from least to greatest.

- 2) Determine whether the relation is a function.

$$H = \{(6, -4), (5, -4), (4, -4), (3, -4), (2, -4)\}$$

Does the given relation represent a function?

**can't have duplicating x values*

☒ Yes

☐ No

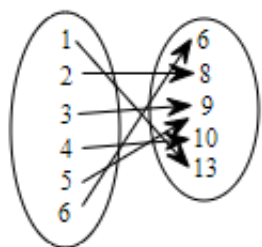
3)

Every year, a music hall of fame inducts legendary musicians and musical acts into its hall of fame. The table shows the number of inductees for each year. Complete a through c below.

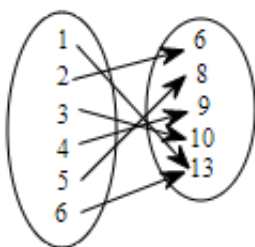
Year	Number of Inductees	Year	Number of Inductees
2001	13	2004	9
2002	9	2005	8
2003	10	2006	6

Look at each as an ordered pair: (1,13) (2,9)

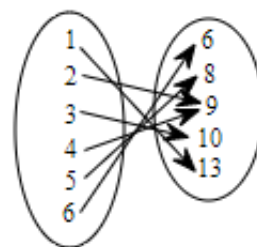
☐ A.



☐ B.



☒ C.

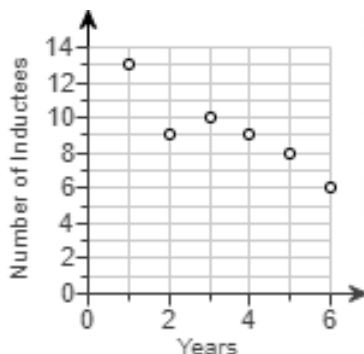


b. Represent the data using ordered pairs. Choose the correct set of ordered pairs below.

☐ A. $\{(1,6), (2,8), (3,9), (4,10), (5,9), (6,13)\}$

☒ B. $\{(1,13), (2,9), (3,10), (4,9), (5,8), (6,6)\}$

☐ C. $\{(1,6), (2,9), (3,10), (4,9), (5,8), (6,13)\}$



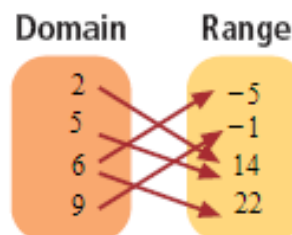
4) Every year a hall of fame inducts legendary people to the hall. The table shows the number of inductees for each year. What are the domain and range of this relation?

Year	2000	2001	2002	2003	2004
Number of Inductees	23	36	21	41	31

The domain is $\{2000, 2001, 2002, 2003, 2004\}$.
(Use a comma to separate answers as needed.)

The range is $\{21, 23, 31, 36, 41\}$.
(Use a comma to separate answers as needed.)

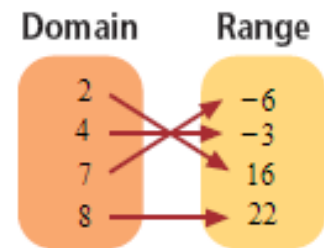
5) Determine whether the relation is a function.



NO, because the domain 6 goes to -5 and 22 of the range

6) Determine whether the relation is a function.

YES, because every element of the domain goes to exactly one element of the range



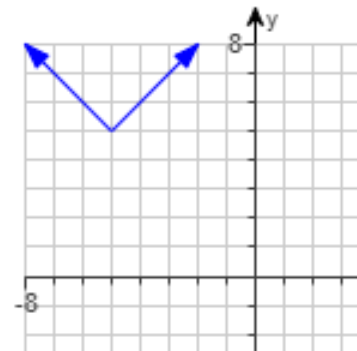
7) Determine if the graph is a function.

Is this the graph of a function?

☒ Yes

☐ No

Vertical line test



8) Given $f(x) = 21x + 10$, find $f(7)$.

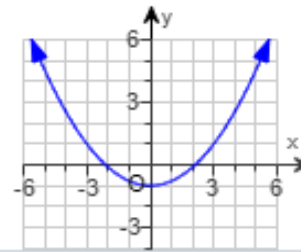
$$f(7) = 157$$

$$21(7) + 10 = 157$$

9) Given $f(x) = 20x + 14$, find $f(4)$.

$$20(4) + 14 = 94$$

- 10) Find the domain and range of the relation and determine whether it is a function.



What is the domain of the relation?

- ☐ A. $-3 < x < 3$
☐ B. $-6 < x < 6$
☐ C. $-1 < x < \infty$
☒ D. $-\infty < x < \infty$

Domain is where the graph is left to right
left and right

What is the range of the relation?

- ☐ A. $-6 < y < 6$
☒ B. $-1 \leq y < \infty$
☐ C. $-3 < y < 3$

Range is where the graph is from bottom to top
up and uses the y-value

Is the relation a function?

- ☐ No
☒ Yes

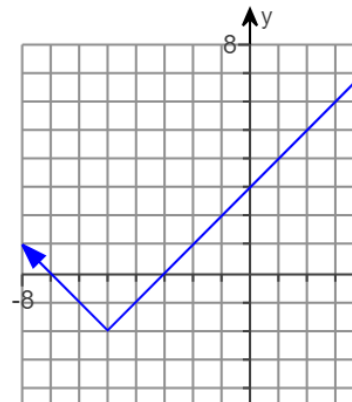
Vertical line test

- 11) Determine if the graph is a function.

vertical line test

Is this the graph of a function?

- ☐ No
☒ Yes



- 12) Given $f(x) = 18x + 13$, find $f(7)$.

$$18(7) + 13 = 139$$

- 13) Find the domain and range of the relation and determine whether it is a function.

left to right

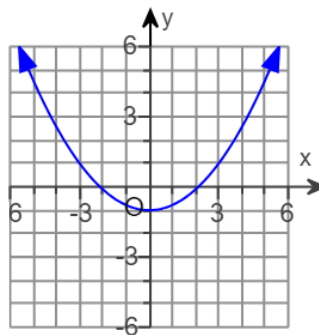
bottom to top

What is the domain of the relation?

- ☐ A. $-6 < x < 6$
- ☐ B. $-1 < x < 1$
- ☐ C. $-1 < x < \infty$
- ☒ D. $-\infty < x < \infty$ left and right

What is the range of the relation?

- ☒ A. $-1 \leq y < \infty$ up
- ☐ B. $-1 < y < 1$
- ☐ C. $-6 < y < 6$
- ☐ D. $-\infty < y < \infty$



Is the relation a function?

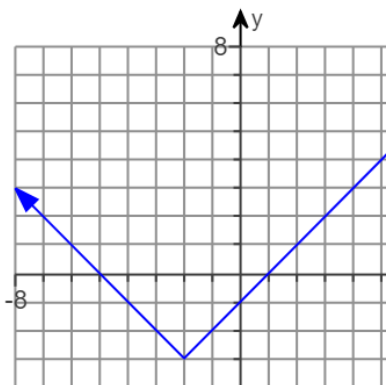
- ☒ Yes
- ☐ No

- 14) Determine if the graph is a function.

vertical line test

Is the relation a function?

- ☒ Yes
- ☐ No



- 15) Given $f(x) = 21x + 13$, find $f(5)$.

$$21(5) + 13 = 118$$

- 16) Find the domain and range of the relation and determine whether it is a function.

Domain: left to right

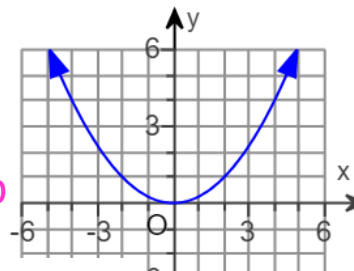
Range: bottom to top

What is the domain of the relation?

- ☐ A. $-6 < x < 6$
- ☐ B. $-1 < x < 1$
- ☐ C. $-1 < x < \infty$
- ☒ D. $-\infty < x < \infty$ left and right

What is the range of the relation?

- ☐ A. $-6 < y < 6$
- ☒ B. $0 \leq y < \infty$ up
- ☐ C. $-1 < y < 1$
- ☐ D. $-\infty < y < \infty$



Is the relation a function?

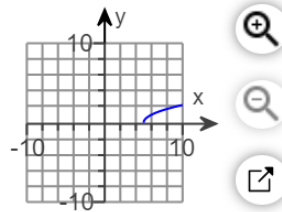
- ☒ Yes
- ☐ No

17) Graph the following function.

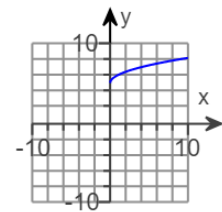
$$y = \sqrt{x} + 5$$

Up 5 units

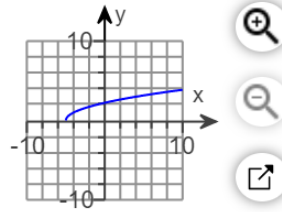
☐ A.



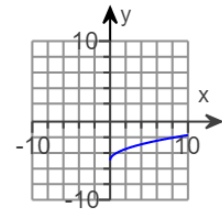
☒ B.



☐ C.



☐ D.

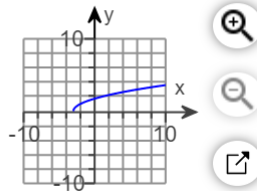


18) Graph the following function.

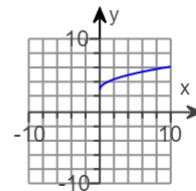
$$y = \sqrt{x+3}$$

Left 3 units

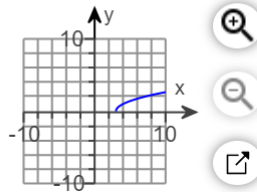
☒ A.



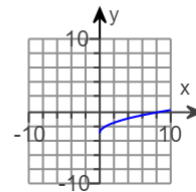
☐ B.



☐ C.



☐ D.

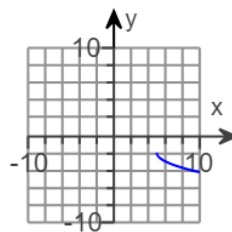


19) Use transformations to graph the function.
State the domain and range.

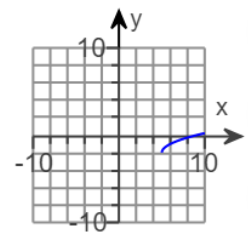
$$y = -\sqrt{x-5} - 2$$

Reflect across x-axis. Right 5, down 2

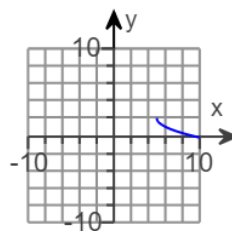
☒ A.



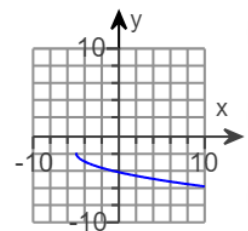
☐ B.



☐ C.



☐ D.



What is the domain?

[5,∞) **right**

(Type your answer in interval notation.)

What is the range?

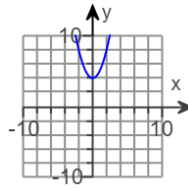
(-∞, -2] **down**

(Type your answer in interval notation.)

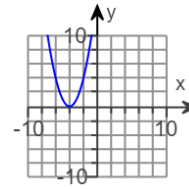
20) Graph the following function.

$$y = x^2 - 4$$

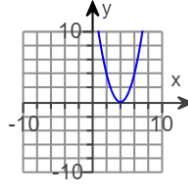
☐ A.



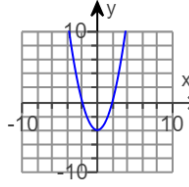
☐ B.



☐ C.



☒ D.

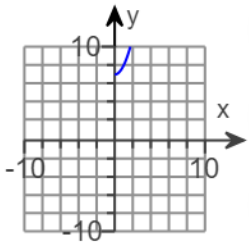


21) Graph the relation. Determine the domain and range, and whether the relation is a function.

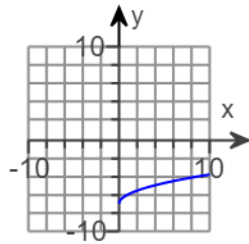
$$y = \sqrt{x} - 7$$

down 7

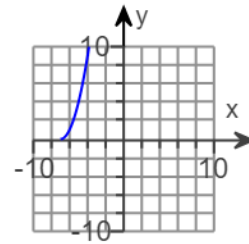
☐ A.



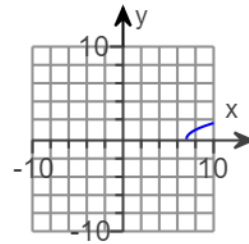
☒ B.



☐ C.



☐ D.



left to right

What is the domain of the relation?

bottom to top

What is the range of the relation?

☒ A. $[0, \infty)$ right

☐ B. $[7, \infty)$

☐ C. $(-\infty, 7]$

☐ D. $(-\infty, \infty)$

☐ A. $(-\infty, -7]$

☐ B. $(-\infty, \infty)$

☐ C. $[0, \infty)$

☒ D. $[-7, \infty)$ up

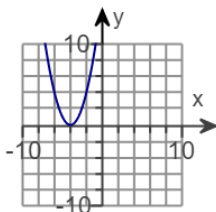
Is the relation a function?

☒ Yes

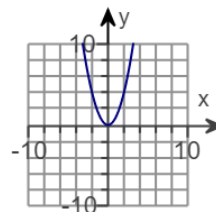
☐ No

22) Choose the graph that matches the function $y = (x + 4)^2 + 2$.

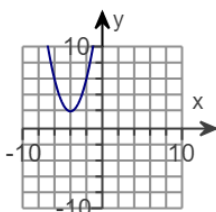
☐ A.



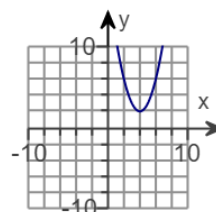
☐ B.



☒ C.



☐ D.



- 23) Use transformations to graph the function. State the domain and range.

$$y = |x - 2| + 4$$

Reflect across x-axis. Right 2, up 4

What is the domain?

$(-\infty, \infty)$

left and right

(Type your answer in interval notation.)

What is the range? $[4, \infty)$

up

(Type your answer in interval notation.)

- 24) Use transformations to graph the function. State the domain and range.

$$y = -\sqrt{x - 4} + 3$$

Reflect across x-axis. Right 5, down 2

What is the domain?

$[4, \infty)$

right

(Type your answer in interval notation.)

What is the range?

$(-\infty, 3]$

down

(Type your answer in interval notation.)

- 25) Use transformations to graph the function. State the domain and range.

$$y = -\frac{1}{4}\sqrt{x+2} - 3$$

Reflect across x-axis. Left 2, down 3

What is the domain?

$[-2, \infty)$

right

(Type your answer in interval notation.)

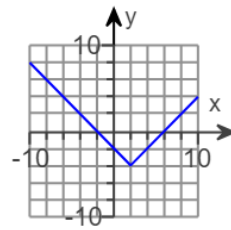
What is the range?

$(-\infty, -3]$

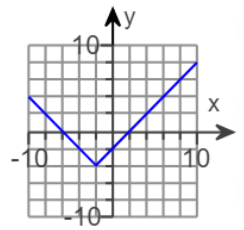
down

(Type your answer in interval notation.)

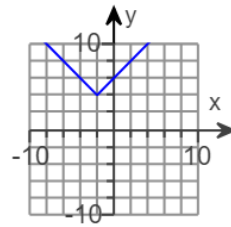
☐ A.



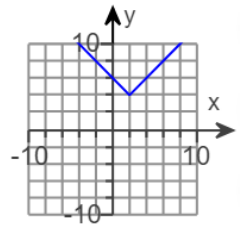
☐ B.



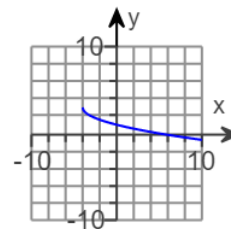
☐ C.



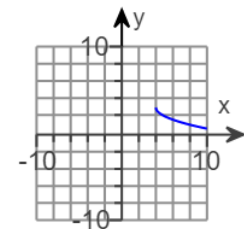
☒ D.



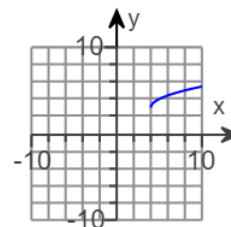
☐ A.



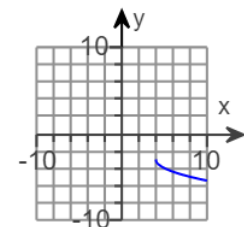
☒ B.



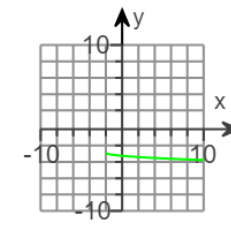
☐ C.



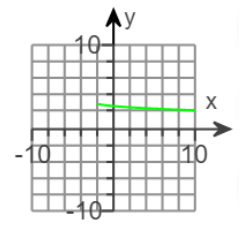
☐ D.



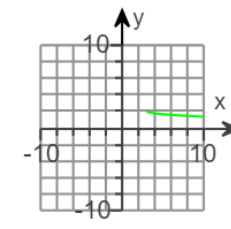
☒ A.



☐ B.



☐ C.



☐ D.

