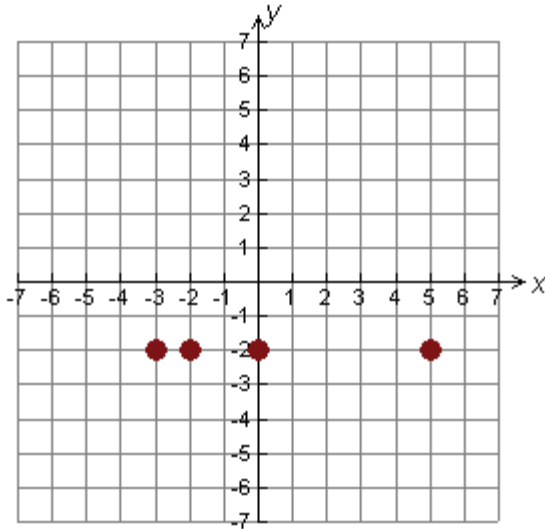


Analyzing Relations and Functions (pp. 1 of 5) **KEY**

1. Graph the given set of points, then answer the questions that follow.

$$\{(5, -2), (-3, -2), (0, -2), (-2, -2)\}$$



- Identify the domain.

$$\{-3, -2, 0, 5\}$$

- Identify the range.

$$\{-2\}$$

- Is the relation a function? Explain.

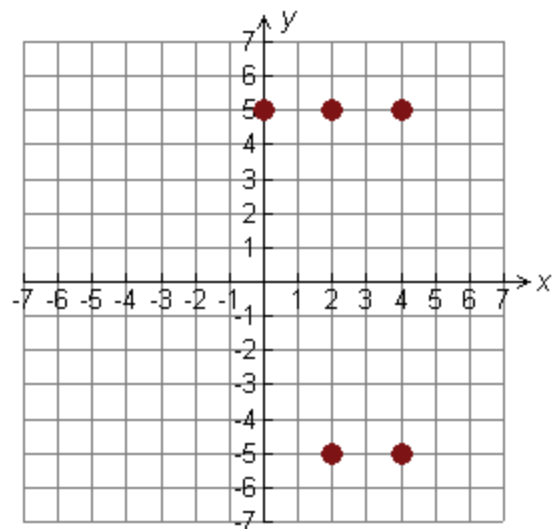
Yes, it is a function; x's do not repeat

- Is it continuous or discrete? Explain.

Discrete, individual points not connected

2. Graph the given set of points, then answer the questions that follow.

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



- Identify the domain.

$$\{0, 2, 4\}$$

- Identify the range.

$$\{-5, 5\}$$

- Is the relation a function? Explain.

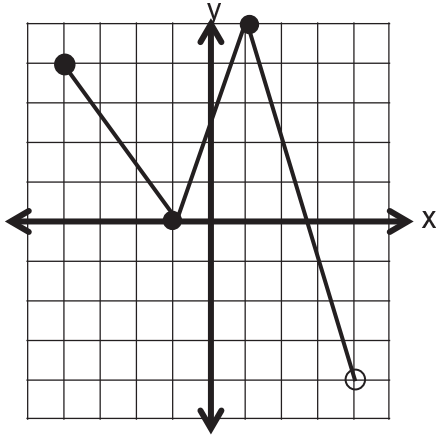
No, it is not a function; the x's repeat

- Is it continuous or discrete? Explain.

Discrete, individual points not connected

Analyzing Relations and Functions (pp. 2 of 5) **KEY**

3. Provide information about the relation graphed below.



- Identify the domain.

$$-4 \leq x < 4$$

- Identify the range.

$$-4 < y \leq 5$$

- Is it continuous or discrete? Explain.

Continuous, infinite number of points that are connected

- Is the relation a function? Explain.

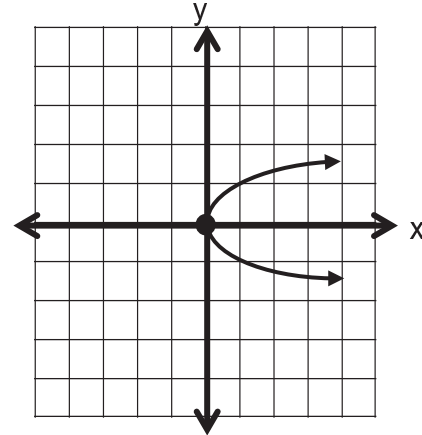
Yes, it is a function; any vertical line will cross graph only once.

- If it is a function, tell the intervals where it is increasing and decreasing.

Increasing: $-1 < x < 1$

Decreasing: $-4 < x < -1, 1 < x < 4$

4. Provide information about the relation graphed below.



- Identify the domain.

$$x \geq 0$$

- Identify the range.

y can be any real number

- Is it continuous or discrete? Explain.

Continuous, infinite number of points that are connected

- Is the relation a function? Explain.

No, it is not a function; a vertical line can cross the graph at more than one point.

- If it is a function, tell the intervals where it is increasing and decreasing.

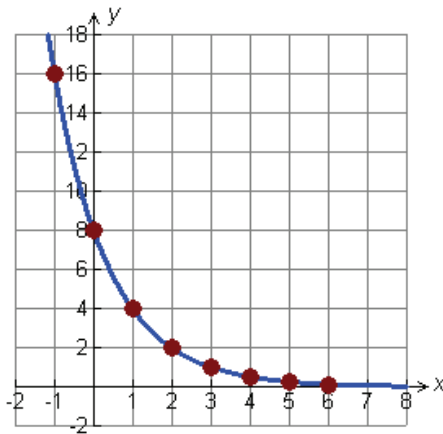
Not possible, not a function

Analyzing Relations and Functions (pp. 3 of 5) **KEY**

5. For the given equation, develop a table of values to produce a graph. Then answer the questions that follow.

$$y = 8\left(\frac{1}{2}\right)^x$$

x	y
-1	16
0	8
1	4
2	2
3	1
4	0.5
5	0.25
6	0.125

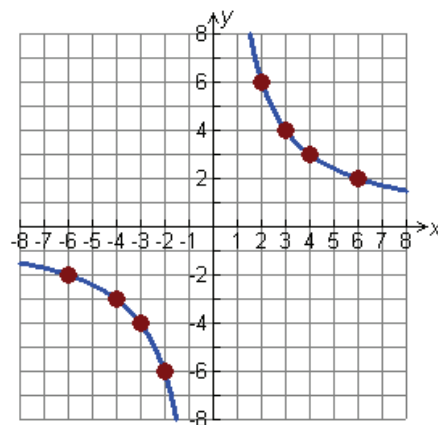


- Identify the domain and range.
Domain: x can be any real number
Range: $y > 0$
- Identify the intervals where the function is increasing or decreasing.
Decreasing for all values of x
- Is it continuous or discrete? Explain.
Continuous, infinite number of points that are connected
- Identify the parent function.
Exponential Parent Function

6. For the given equation, develop a table of values to produce a graph. Then answer the questions that follow.

$$y = \frac{12}{x}$$

x	y
-6	-2
-4	-3
-3	-4
-2	-6
0	ERROR
2	6
3	4
4	3
6	2



- Identify the domain and range.
Domain: $x \in \mathbb{R}, x \neq 0$
Range: $y \in \mathbb{R}, y \neq 0$
- Identify the intervals where the function is increasing or decreasing.
Decreasing on $x < 0$ and $x > 0$
- Is it continuous or discrete? Explain.
Continuous, infinite number of points that are connected
- Identify the parent function.
Rational Parent Function

Analyzing Relations and Functions (pp. 4 of 5) **KEY**

If $f(x) = 5x - 3$, and $g(x) = x^2 + x - 2$, evaluate the following.

7. $f(4)$
 17

8. $g(-2)$
 0

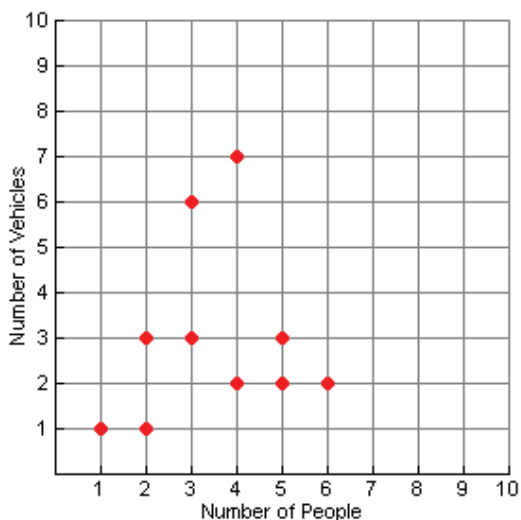
9. $f\left(\frac{3}{5}\right)$
 0

10. $g(a - 1)$
 $a^2 - a - 2$

11. A survey was taken to collect data on the vehicles per household as related to the number of persons in the household. The data were collected in the table below.

Number of People	2	3	6	5	4	3	1	2	4	5
Number of Vehicles	3	6	2	3	7	3	1	1	2	2

Use the data to create a scatter plot.



Does the data describe a functional relationship? Explain.

- The data is not functional. X's occur more than once.

Is the data discrete or continuous?

- The data is discrete. Number of people and vehicles cannot be in fractional parts.

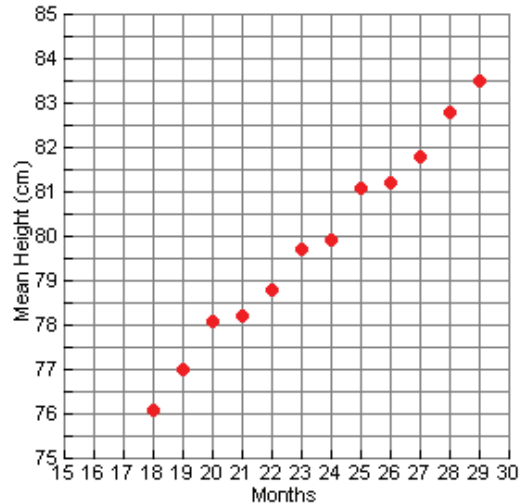
Could the data be used to make predictions? Explain your reasoning.

- The data would not be good for predictions because no patterns are evident.

Analyzing Relations and Functions (pp. 5 of 5) **KEY**

12. The following data comparing the mean height of children in relation to their age was collected in Kalama, Egypt. Plot the data, and then answer the questions that follow.

Age (months)	Mean Height (cm)
18	76.1
19	77.0
20	78.1
21	78.2
22	78.8
23	79.7
24	79.9
25	81.1
26	81.2
27	81.8
28	82.8
29	83.5



- Is the relationship a function? Explain.
 - The data does appear to be functional. Each age in months has its own specific mean height and age in months does not repeat.
- If it is a function, identify increasing or decreasing intervals.
 - The function is increasing for all x-values. As x-values increase, y-values increase.
- Identify the domain and range of the problem situation.
 - Domain: From 18 to 29 months
 - Range: From 76.1 to 83.5 cm
- Predict the mean height of a 21.5 month-old baby. Explain your reasoning.
 - A 21.5 month-old baby would have a mean height of approximately 78.5 cm as read from the graph.
- Could you predict the height of a 21 year-old adult? Explain your reasoning.
 - The mean height of a 21 year-old adult could not be read from this graph. If the graph were extended to predict the height of a 21 year-old adult, they would be approximately 7.5 feet tall. That is unrealistic. Because the growth rate of children is much faster, the data would only give realistic predictions within its own range.