

Just in Time Quick Check

Standard of Learning 8.PFA.2

Strand: Patterns, Functions, and Algebra

Standard of Learning 8.PFA.2

The student will determine whether a given relation is a function and determine the domain and range of a function.

Students will demonstrate the following Knowledge and Skills:

- a) Determine whether a relation, represented by a set of ordered pairs, a table, or a graph of discrete points is a function. Sets are limited to no more than 10 ordered pairs.
- b) Identify the domain and range of a function represented as a set of ordered pairs, a table, or a graph of discrete points.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting and Prerequisite SOL: N/A

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1. Does the relation presented in the table represent a function? Explain your reasoning.

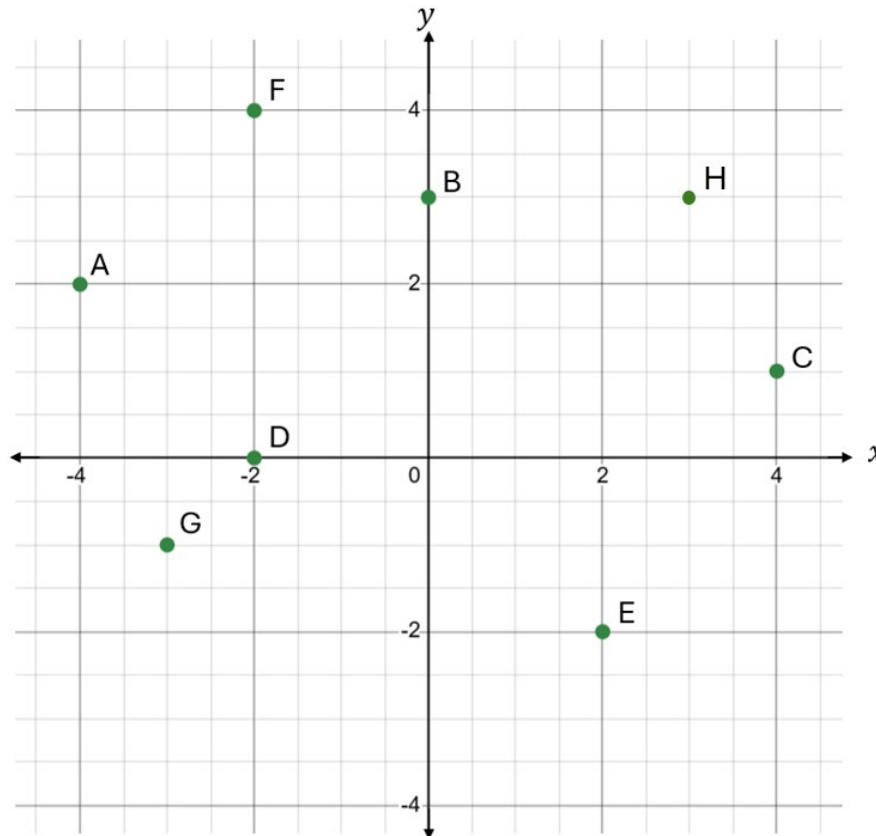
x	y
-3	2
-3	4
-1	1
1	3
3	-3

2. Does the relation presented in the set of ordered pairs represent a function? Explain your reasoning.

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

3. The relation pictured on the coordinate plane does not represent a function.

- Name one point that you could relocate to make the relation a function.
- List the new ordered pair for the relocated point.
- Explain your reasoning.



4. Sabrina's teacher asked her to list the range for the function represented in the table below.

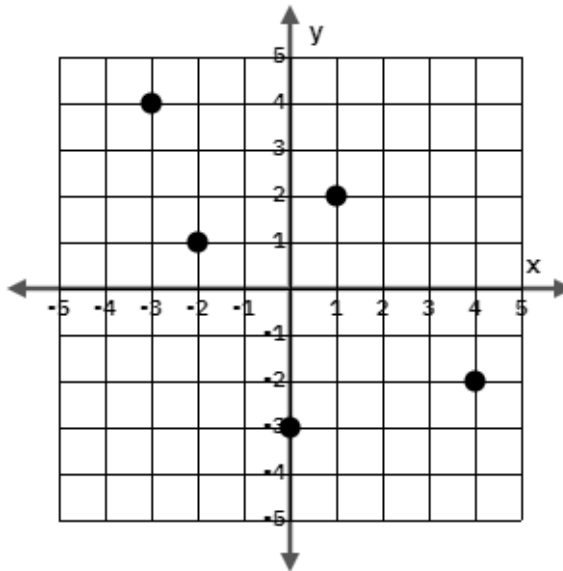
x	y
-3	-7
-1	-3
0	-1
2	3
4	7

What should Sabrina write as the range of this function? Explain.

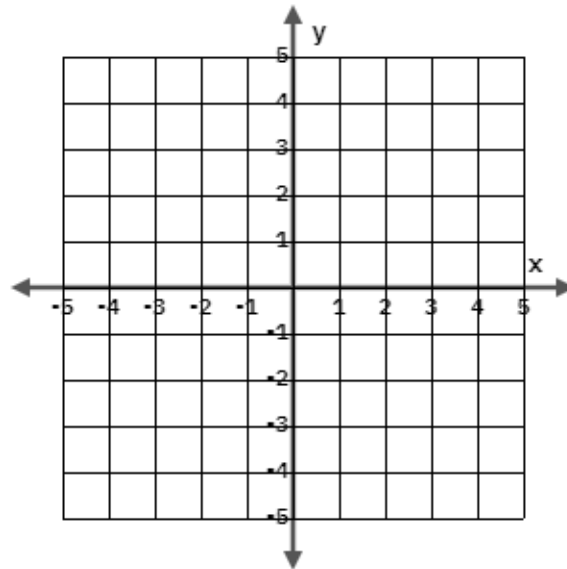
5. What is the domain of the relation shown?

$$\{ (-1, 2), (-5, 3), (-1, -4), (0, -6), (4, -2) \}$$

6. The following graph shows a relation. What is the range of the relation?



7. Corey graphed a relation that has a domain of $\{-3, -2, 0, 1, 4\}$. Use the coordinate plane below to show one possible relation Corey could have graphed.



8.PFA.2 Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

1. Does the relation presented in the table represent a function? Explain your reasoning.

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

A common error students may make is declaring this relation represents a function because none of the y -values repeat. This may indicate that students do not understand the definition of a function and that for a relation to be a function, each input must be paired to a unique output. It may be helpful for students to graph the points given on a coordinate plane, which will allow them to see that the input -3 relates to two outputs (2 and 4), therefore, the relation is not a function.

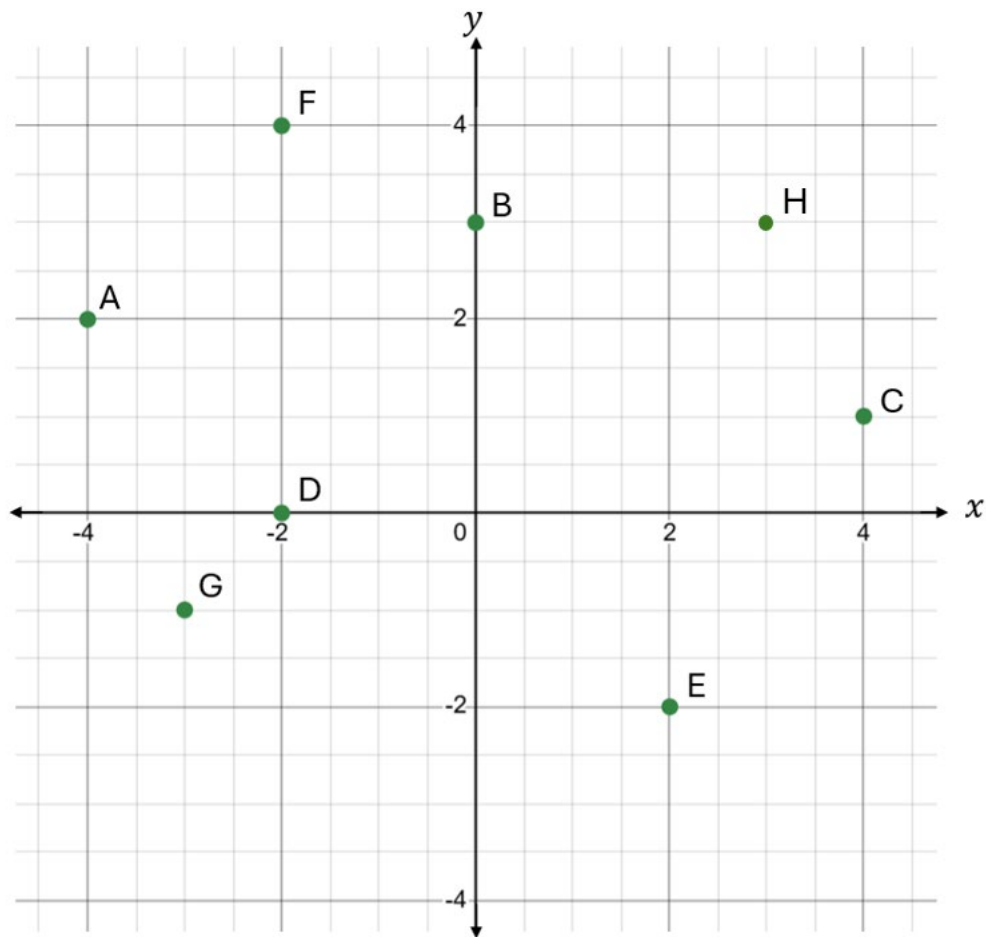
2. Does the relation presented in the set of ordered pairs represent a function? Explain your reasoning.

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

A common error is for students to say that this relation does not represent a function because of the repeating y -value of 2. This may indicate that students believe that if any y -value repeats then the relation is not a function. These students may benefit from graphing the ordered pairs so they can see the relation represented visually, allowing them to see that the points are not aligned vertically. These students could also benefit from experimenting with a function machine whose rule is $y = 0x + 2$. Each input, or x -value, has a unique output, or y -value. All of the output values are the same, 2.

3. The relation pictured on the coordinate plane does not represent a function.

- Name one point that you could relocate to make the relation a function.
- List the new ordered pair for the relocated point.
- Explain your reasoning.



A common error is for students to name either point B or H as the point that should be relocated because these points lie on the same horizontal line. This may indicate that students are confusing the vertical line test with a horizontal line test. These students may benefit from representing the ordered pairs in a table to see that points B and H each have an x-value that is related to exactly one y-value. Additionally, by representing the ordered pairs in a table, students will be able to see that points D and F have the same input, but each relate to a different output.

4. Sabrina's teacher asked her to list the range for the function represented in the table below.

x	y
-3	-7
-1	-3
0	-1
2	3
4	7

What should Sabrina write as the range of this function? Explain.

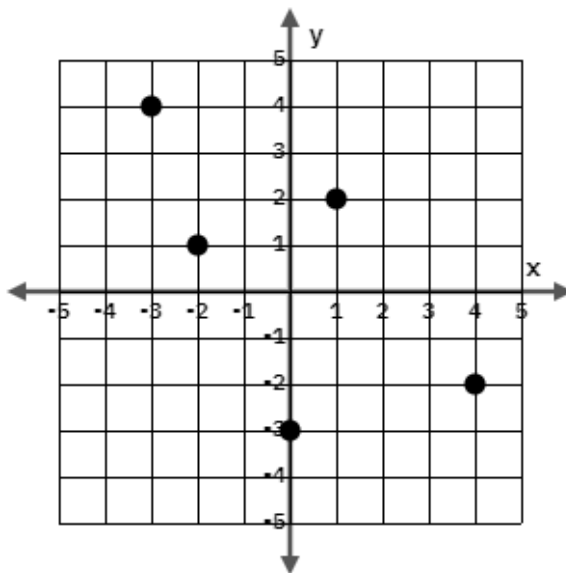
A common error some students may make is to confuse the definitions of domain and range. If students are listing x -values for the range (or they are listing y -values for the domain), this might indicate a need to revisit the vocabulary. Students need to understand that the domain of a function is the set of all possible values of the independent variable, or the x -values, and the range of a function is the set of all possible values of the dependent variable, or the y -values.

5. What is the domain of the relation shown?

$$\{(-1, 2), (-5, 3), (-1, -4), (0, -6), (4, -2)\}$$

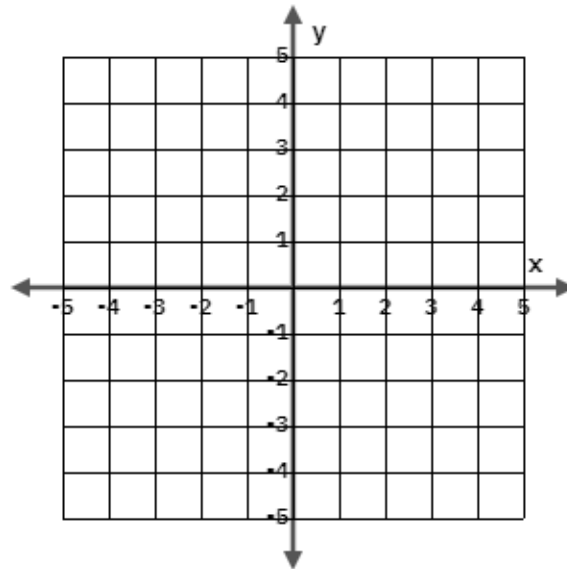
A common error students may make is to list the y -values for the domain instead of the x -values. This may indicate that students are confusing the definitions of domain and range (see #4 above). However, if students understand the definition of domain and range, this error may indicate they do not understand that ordered pairs are written as (x, y) . Students may need more experience with writing and interpreting ordered pairs.

6. The following graph shows a relation. What is the range of the relation?



A common error students may make is to incorrectly list $\{-3, -2, 0, 1, 4\}$ as the range. Students may understand the definition of range but have difficulty identifying and writing ordered pairs for the graphed points. Students may also make this error by assuming that the y -axis is vertical and then looking at each vertical line to determine the range values. It may be helpful for students to write the ordered pairs in a table, so they can determine which values represent the domain and which values represent the range.

7. Corey graphed a relation that has a domain of $\{-4, -3, -1, 2, 3\}$. Use the coordinate plane below to show one possible relation Corey could have graphed.



Students may incorrectly graph a relation with a range of $\{-4, -3, -1, 2, 3\}$. Students may understand the definition of domain but have difficulty graphing ordered pairs. It may be helpful for students to create a table of x - and y -values, and put the x -values of $-4, -3, -1, 2,$ and 3 into the table, then create related y -values, and then plot the points on the coordinate grid. Because there are many possible solutions to this problem, students may also benefit from sharing their solutions with a classmate or a small group to see how others approached this problem.