

**Richmond Public Schools**  
Curriculum Framework  
*Grade 7 Honors (7/8)*

Strand: Measurement and Geometry	
<b>8.15 The student will</b> <b>a) determine whether a given relation is a function; and</b> <b>b) determine the domain and range of a function.</b>	
Suggested Pacing	
Related Standards	
Spiral Down:	Spiral Up:
Essential Questions	Common Misconceptions
<ul style="list-style-type: none"> <li>• What is the process for determining if a relation is a function?</li> <li>• How is the study of patterns in math applicable to real-life?</li> </ul>	<ul style="list-style-type: none"> <li>• Function VS. Relation: students may believe that all relationships having an input and an output are functions, and therefore, misuse the function terminology.</li> <li>• Different Representations: students may not be able to determine if a relation is a function if it's in table form vs. graph form or a set of points</li> </ul>
Understanding the Standard	Essential Knowledge and Skills
<ul style="list-style-type: none"> <li>• A relation is any set of ordered pairs. For each first member, there may be many second members.</li> <li>• A function is a relation between a set of inputs, called the domain, and a set of outputs, called the range, with the property that each input is related to exactly one output.</li> <li>• As a table of values, a function has a unique value assigned to the second variable for each value of the first variable. In the “not a function” example, the input value “1” has two different output values, 5 and -3, assigned to it, so the example is not a function.</li> </ul>	<ul style="list-style-type: none"> <li>• 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. (a)</li> <li>• Identify the domain and range of a function represented as a set of ordered pairs, a table, or a graph of discrete points. (b)</li> </ul>

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function

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

not a function

x	y
2	3
1	5
0	4
1	-3

- As a set of ordered pairs, a function has a unique or different  $y$ -value assigned to each  $x$ -value. For example, the set of ordered pairs,  $\{(1, 2), (2, 4), (3, 2), (4, 8)\}$  is a function. This set of ordered pairs,  $\{(1, 2), (2, 4), (3, 2), (2, 3)\}$ , is not a function because the  $x$ -value of "2" has two different  $y$ -values.
- As a graph of discrete points, a relation is a function when, for any value of  $x$ , a vertical line passes through no more than one point on the graph.
- Some relations are functions; all functions are relations.
- Graphs of functions can be discrete or continuous.
- In a discrete function graph there are separate, distinct points. You would not use a line to connect these points on a graph. The points between the plotted points have no meaning and cannot be interpreted. For example, the number of pets per household represents a discrete function because you cannot have a fraction of a pet.
- Functions may be represented as ordered pairs, tables, graphs, equations, physical models, or in words. Any given relationship can be represented using multiple representations.
- A discussion about determining whether a continuous graph of a relation is a function using the vertical line test may occur in grade eight, but will be explored further in Algebra I.



- The domain is the set of all the input values for the independent variable or  $x$ -values (first number in an ordered pair).

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- The range is the set of all the output values for the dependent variable or  $y$ -values (second number in an ordered pair)
- If a function is comprised of a discrete set of ordered pairs, then the domain is the set of all the  $x$ -coordinates, and the range is the set of all the  $y$ -coordinates. These sets of values can be determined given different representations of the function.

- Example: The domain of a function is  $\{-1, 1, 2, 3\}$  and the range is  $\{-3, 3, 5\}$ . The following are representations of this function:

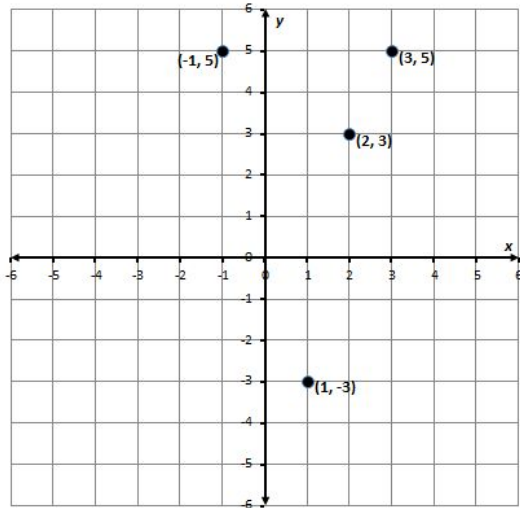
o The function represented as a table of values:

$x$	$y$
-1	5
1	-3
2	3
3	5

o The function represented as a set of ordered pairs:  $\{(-1, 5), (1, -3), (2, 3), (3, 5)\}$

o The function represented as a graph on a coordinate plane:

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**Vocabulary**

Relation	Domain	Range
Graph	Function	Ordered pairs
Input	Output	Independent Variable
Dependent Variable		

**Assessment**

**Instructional Activities Organized by Learning Objective**

Textbook

Notes

Resources

- Print
- Technology-based

Station Activities

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<b>Cross-Curricular Connections</b>	<b>Tiered Differentiations</b>