

Day 1 - Functions - Notes

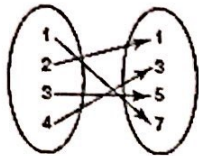
Learning Goal: I can determine whether a relation is a function or not. 0 1 2 3 4

In 8th grade, you learned to express mathematical relationships using a coordinate graph. Relationships can also be represented by a set of ordered pairs, which is called a **relation**. Relations can be represented using tables, graphs, or mappings.

A **function** maps each input to one and only one output, which means a function has no input with more than one output (No x-values going to two different y-values). Each of the below representations are relations. The first coordinate of an ordered pair in a relation is the **input**, and the second coordinate is the **output**. We refer to the set of all inputs as the **domain** and the set of all outputs as the **range**.

Determine if the following are functions. Then state the domain and range:

a.

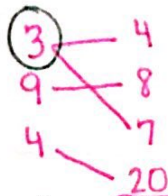


Function or Not a Function

Domain: $\{1, 2, 3, 4\}$

Range: $\{1, 3, 5, 7\}$

b. $\{(3, 4), (9, 8), (3, 7), (4, 20)\}$

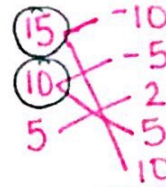


Function or Not a Function

Domain: $\{3, 4, 9\}$

Range: $\{4, 7, 8, 20\}$

c. $\{(15, -10), (10, -5), (5, 2), (10, 5), (15, 10)\}$



Function or Not a Function

Domain: $\{5, 10, 15\}$

Range: $\{-10, -5, 2, 5, 10\}$

d.

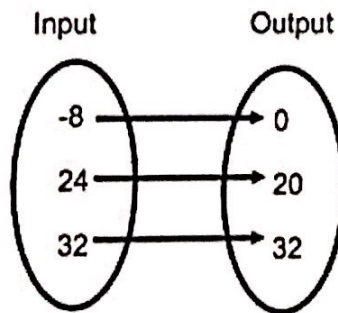
Input	Output
-10	20
-5	10
0	0
5	10
10	20

Function or Not a Function

Domain: $\{-10, -5, 0, 5, 10\}$

Range: $\{0, 10, 20\}$

e.

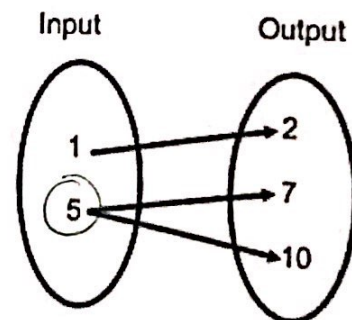


Function or Not a Function

Domain: $\{-8, 24, 32\}$

Range: $\{0, 20, 32\}$

f.



Function or Not a Function

Domain: $\{1, 5\}$

Range: $\{2, 7, 10\}$

g. (telephone number, person)

h. (person, car)

i. (shirt color, student)

Function or Not a Function

Every phone number goes to one specific person (or household)

Function or Not a Function

can go either way based on justification

Each person owns their own car, BUT a person can own multiple cars

Function or Not a Function

Multiple students can be wearing the same shirt color.

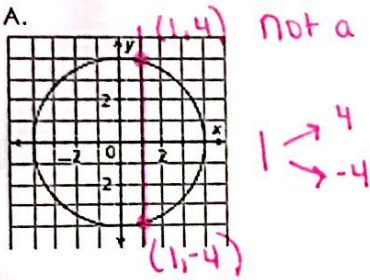
blue shirt → Cody
→ Brady

Testing if a Function is a Function (Vertical Line Test)

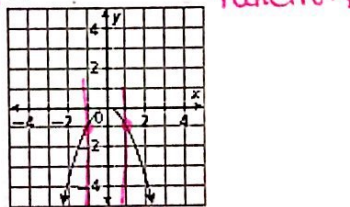
Another way to tell if a relation is a function is the **Vertical Line Test**. The Vertical Line Test is used with graphs of relations. To use the Vertical Line Test, consider all of the vertical lines that could be drawn on the graph of the relation. If any of the vertical lines intersect the graph of the relation at more than one point, then the relation is not a function.

Ex. Use the Vertical Line Test to determine if the graphs of the relations are functions.

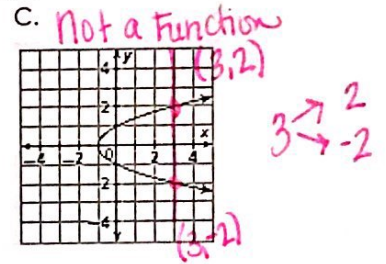
A.



B.



C.



Explain why the Vertical Line test determines whether a graph is a function or not:

If two points are on a vertical line, then both their x-values are the same, but their y-values are different. Thus one x-value is producing two different y-values

Different Meanings of Domain and Range Organizer

D	Domain	R	Range
I	Input	O	Output
X	x-coordinate	Y	y-coordinate
I	independent variable	D	dependent variable