answers_HW page 41

List the domain and range for each relation as a set. Then decide if the relation is a function.

1.

x	y
7	3
8	-5
7	-2
-1	-8

domain: {-1, 7, 8}

range: {-8, -5, -2, 3}

function? No

2.

x	y
-5	5
20	-20
-20	-20
5	5

domain: {-20, -5, 5, 20}

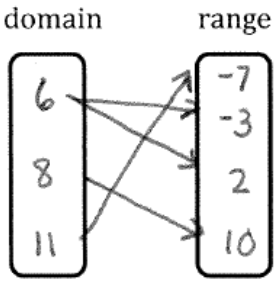
range: {-20, 5}

function? yes

Check your HW! (now)

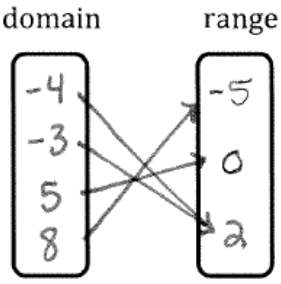
Use a mapping diagram to list the domain and range of each relation. Then decide if the relation is a function.

3. {(6, 2), (8, 10), (6, -3), (11, -7)}



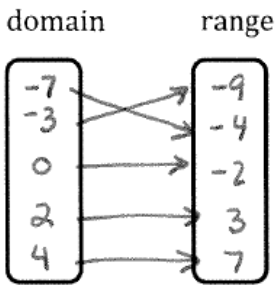
function? No

4. {(5, 0), (-4, 2), (8, -5), (-3, 2)}



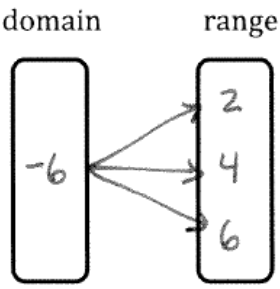
function? Yes

5. {(-3, -9), (-7, -4), (0, -2), (2, 3), (4, 7)}



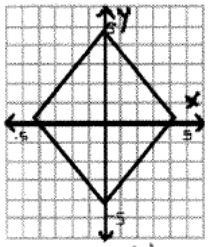
function? Yes

6. {(-6. 2), (-6, 4), (-6, 6)}

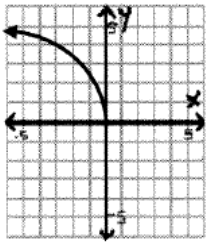


function? No

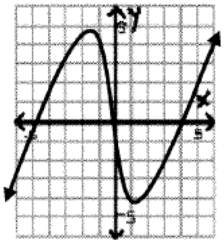
Use a vertical line test to determine if each graph is a function.

7. 

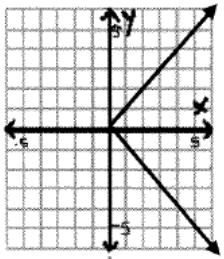
No

8. 

yes

9. 

yes

10. 

No

Function Rules, Tables, and Graphs

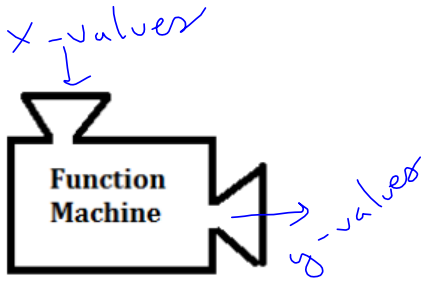
https://www.youtube.com/watch?feature=player_detailpage&v=VUTXsPFx-qQ

page 64

Function Rules, Tables, and Graphs

A function rule is an equation that describes a function. You can think of a function rule as an input–output machine.

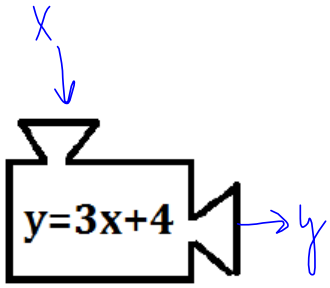
The x-values are the set of input values.
The y-values are the set of output values.



Example 1: Evaluating a Function Rule

If you know the input values, you can use a function rule to find the output values. The output values depend on the input values.

x	y
-3	-5
-2	-2
-1	1
0	4
1	7
2	10
3	13



An equation could also be written with y as f(x).
So $y = -2x + 1$ could be written as f(x) = -2x + 1.
This is known as function notation.

a. Evaluate: $f(x) = -2x + 1$ for the domain $\{-2 \leq x \leq 2\}$

Show work here:

$f(-2) = -2(-2) + 1 = 5$

$f(-1) = -2(-1) + 1 = 3$

$f(0) = -2(0) + 1 = 1$

$f(1) = -2(1) + 1 =$

$f(2) = -2(2) + 1 =$

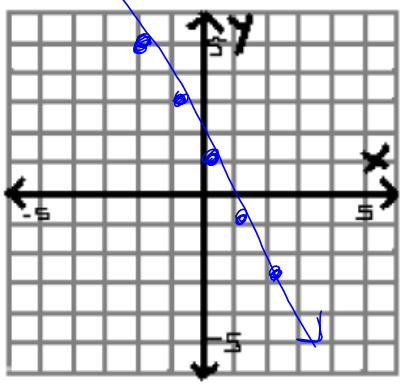
x	f(x)
-2	5
-1	3
0	1
1	-1
2	-3

An interesting thing happens when we graph the input/output pairs as coordinate points on a graph. Use the values from the table you just made on the last page to make five sets of coordinate pairs and plot them on the graph.

(-2, 5) (1, -1)

(-1, 3) (2, -3)

(0, 1)



What do you notice about the points? They all line up
What do you think would happen if we chose more x-values to evaluate with the same function rule? They would also line up.
For this reason, we connect all the points with a line with arrows on the end.

√ Understanding Check:

Find the range of each function for the domain, $\{-2 \le x \le 2\}$. Make a table for each set of values. Then graph the coordinate pairs. Connect the points with a line.

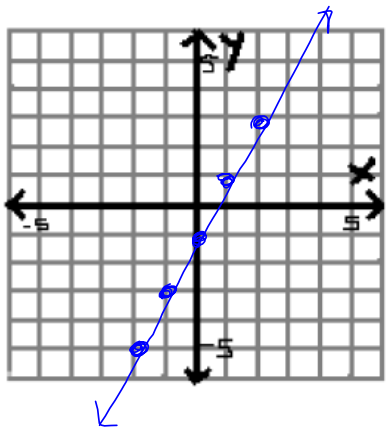
a. $f(x) = 2x - 1$

$f(-2) = -5$

$f(-1) = 2(-1) - 1 = -3$

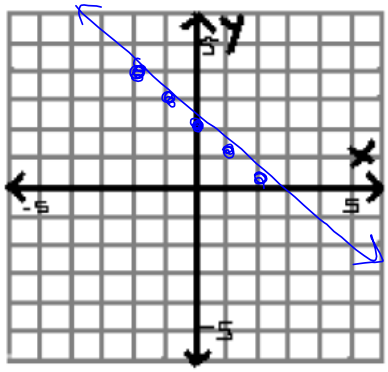
$f(0) = 2(0) - 1 = -1$

x	f(x)
-2	-5
-1	-3
0	-1
1	1
2	3



b. $y = -x + 2$

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



page 66

Each point on the graph of a line is a solution that makes the equation true.

For example: If $x + y = 5$, how many solutions can you think of?

$2 + 3 = 5 \rightarrow (2, 3)$

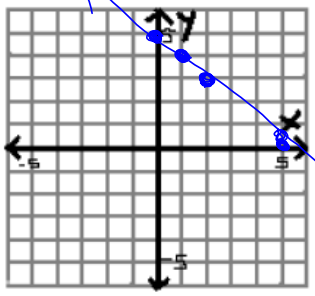
$1 + 4 = 5 \rightarrow (1, 4)$

$5 + 0 = 5 \rightarrow (5, 0)$

$0 + 5 = 5 \rightarrow (0, 5)$

$-6 + 11 = 5 \rightarrow (-6, 11)$

Now graph some of your solutions.



Example 2: Verifying Points on a Line

To verify that a point lies on a line, Substitute its coordinates in for x and y in the equation. If doing so gives a true statement, then the point is on the line.

a. Determine whether (3, –5) lies on the graph of $y = -3x + 4$

Step 1: substitute 3 for x, -5 for y
Step 2: simplify
Step 3: compare

$-5 = -3(3) + 4$
$-5 = -9 + 4$
$-5 = -5$ yes!
The point is a solution.

b. Determine whether (8, 4) lies on the graph of $3y = 2x - 1$

Step 1: sub: $x = 8$, $y = 4$
Step 2: simplify
Step 3: compare

$3(4) = 2(8) - 1$
$12 = 16 - 1$
$12 = 15$
no. (8,4) is not a solution.

√ Understanding Check:

a. Determine whether (1, 6) lies on the graph of $y = 4x - 2$

$x = 1$
$y = 6$
$6 = 4(1) - 2$
$6 = 2$
not a solution.

b. Determine which points lie on the graph of $3y + 5x = 4$

a. (4, 3)
$3(3) + 5(4) = 4$
$9 + 20 = 4$
$29 = 4$
No

b. (5, -7)
$3(-7) + 5(5) = 4$
$-21 + 25 = 4$
$4 = 4$
Yes

c. (-2, 1)
$3(1) + 5(-2) = 4$
$3 - 10 = 4$
$-7 = 4$
No

d. (3, -1)
$3(-1) + 5(3) = 4$
$-3 + 15 = 4$
$12 = 4$
No

66

HW page 42