

Find the value of y so that the line passing through the two points has the given slope.

Week 10

$$(2, y), (4, 5), m = 2$$

$(2, y)$

$$m = \frac{5-y}{4-2}$$

~~$$2 = \frac{5-y}{2}$$~~

$$2(2) = 1(5-y)$$

$$4 = 5 - y$$

$$-\frac{1}{1} = \frac{-5}{-1}, \quad y = 1$$

$$(3, y), (1, 4), m = -\frac{1}{2}$$

$(3, y)$

$$m = \frac{4-y}{1-3}$$

~~$$-\frac{1}{2} = \frac{4-y}{-2}$$~~

$$(-1)(-2) = 2(4-y)$$

$$2 = 8 - 2y$$

$$-8 \quad -8$$

$$-6 = -2y$$

$$\frac{-6}{-2} = \frac{-2y}{-2}$$

$$y = 3$$

Return Quizzes

Homework Questions?

On the top of your paper (by your name) rate yourself for this section:

4 - I can summarize the concepts and explain it to others

3 - I can apply the concept to answer questions correctly

2 - I can apply the concepts but with some mistakes

1 - I need help and know how to apply the concept

0 - I can't apply the concept, even with help

Rating of 0-2 is a warning signal to me that you need help

4.8 Functions and Relations

Goals:

- Identify when a relation is a function.
- Use function notation to represent real-life situation.

EQ: How can you tell if an equation is a function?

The Unit Organizer NAME _____
DATE _____ Mo/Date/Year

← Algebra 1.5 →

② LAST UNIT/Experience Solving Linear Equations	① CURRENT UNIT Graphing Linear Equations & Functions	③ NEXT UNIT/Experience Writing Linear Equations
⑧ Student Activities or Assignments 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8	⑤ UNIT MAP 	⑨ UNIT RELATIONSHIPS Graph Determine Identify Calculate
⑦ UNIT SELF-TEST QUESTIONS 1. How do you use a table to graph a line? 2. How do I find the intercepts in order to graph a line? 3. How can I calculate the slope with coordinates, or a graph, or a real world situation? 4. How do I write and solve a direct variation model? 5. How can I graph a line using the slope and y-intercept? 6. How can I determine a function and then evaluate it?		

Vocabulary

Relation: Any set of ordered pairs.

Function: For each input there is exactly one output.

Function Notation: A more specific way of defining functions.

- a) $f(x)$ means the value of f at x or f of x
- b) $f(x)$ is y .
- c) NOT f times x

Graph of a function:

The graph of a function f is the set of all points $(x, f(x))$, where x is in the domain of the function.

y

Representing Relations

Ordered Pairs: $(-2, 2)$, $(-2, -2)$, $(0, 1)$, $(3, 1)$

Mapping Diagram:

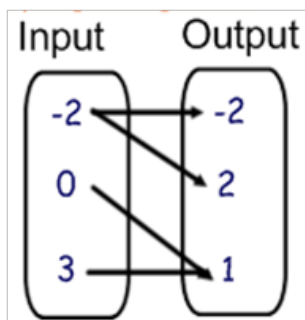
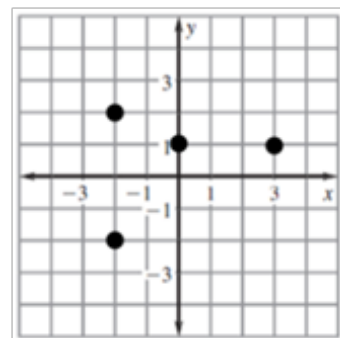


Table:

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

Graph:

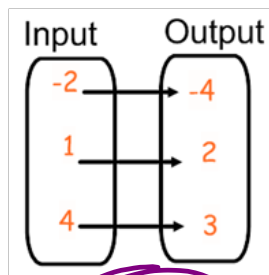


What is the domain? = Set of Inputs

What is the range? Set of outputs

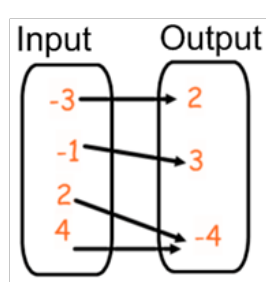
Identifying Functions

Identify if the relation is a function. If it is, give the domain and range.



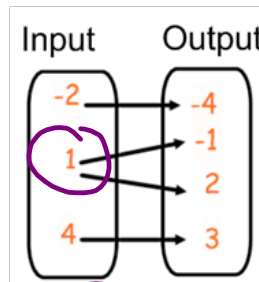
Yes

Domain:
-2, 1, 4
Range:
-4, 2, 3



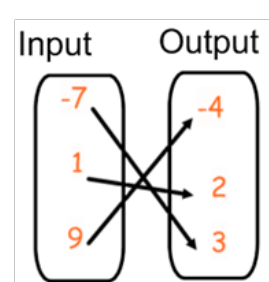
Yes

Domain:
-3, -1, 2, 4
Range:
-4, 2, 3



NO

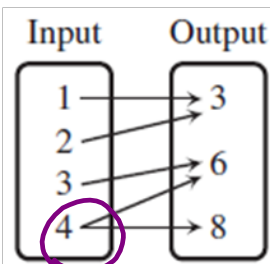
b/c $1 \rightarrow -1$
and $1 \rightarrow 2$



yes

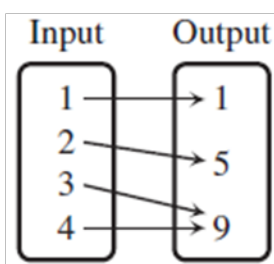
Domain:
-7, 1, 9
Range:
-4, 2, 3

Try It Identify if the relation is a function. If it is, give the domain and range.



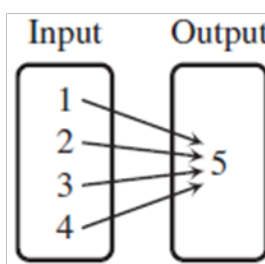
No

$4 \rightarrow 6$
and
 $4 \rightarrow 8$



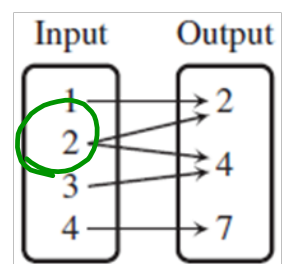
Yes

Domain:
1, 2, 3, 4
Range:
1, 5, 9



Yes $f(x) = 5$

Domain:
1, 2, 3, 4
Range: 5



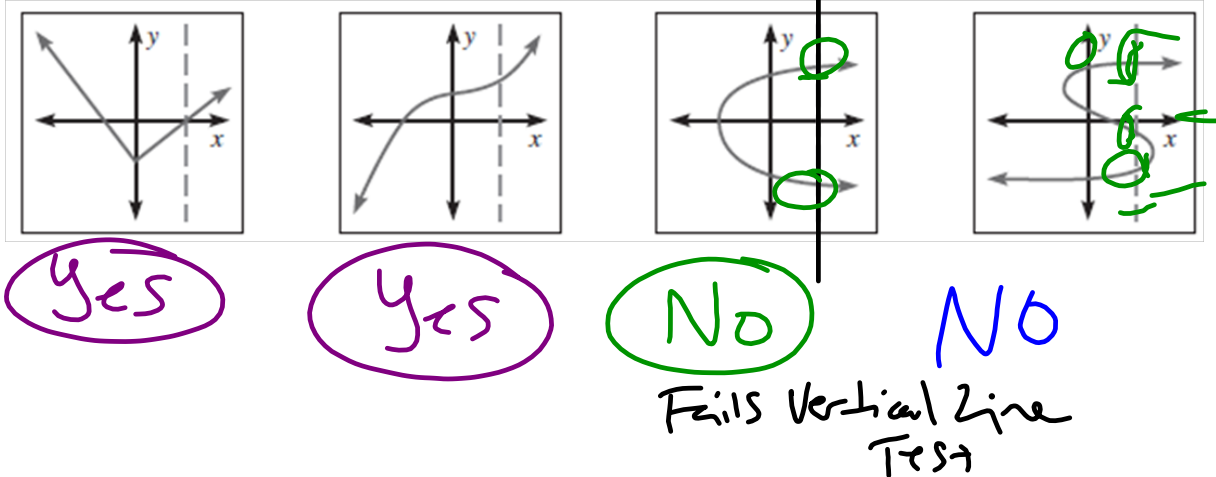
No

$2 \rightarrow 2$
 $2 \rightarrow 4$

Vertical Line Test

A relation is a function of the horizontal-axis variable if and only if **no vertical line passes through two or more points on the graph.**

Determine if the graph is a function.



Evaluating a function

Evaluate the function for the given value of the variable.

a) $f(x) = -3x$ when $x = 2$

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

$$y = -3(2)$$

$$f(2) = -6$$

b) $g(x) = 4x + 20$ when $x = -3$

$$g(-3) = 4(-3) + 20$$

$$g(-3) = -12 + 20$$

$$g(-3) = 8$$

Try It

Evaluate the function for the given value of the variable.

a) $f(x) = 11x + 3$ when $x = -3$

$$f(-3) = 11(-3) + 3$$

$$f(-3) = -33 + 3$$

$$f(-3) = -30$$

b) $g(x) = 6 - 1.75x$ when $x = 10$

$$g(10) = 6 - 1.75(10)$$

$$g(10) = 6 - 17.5$$

$$g(10) = -11.5$$

4.8 Homework Day 1

p.259 #12-28even

Warm UpEvaluate when $x = -4$, $x = 5$, and $x = 0$.

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

$$f(-4) = 3(-4) - 2 \\ = -12 - 2$$

$$f(-4) = -14$$

$$(-4, -14)$$

$$f(5) = 3(5) - 2$$

$$= 15 - 2$$

$$f(5) = 13$$

$$(5, 13)$$

$$f(0) = 3(0) - 2$$

$$f(0) = -2$$

$$(0, -2)$$

x	$f(x)$
-4	-14
5	13
0	-2

Homework Questions?28

$$x = 2 \\ x = 0 \\ x = -3$$

$$f(x) = \frac{2}{7}x + 4$$

$$f(2) = \frac{2}{7}(2) + 4 \\ = \frac{4}{7} + \frac{28}{7}$$

$$f(2) = \frac{32}{7}$$

$$\frac{2}{7}(-3) + 4$$

$$-\frac{6}{7} + \frac{28}{7}$$

$$= \frac{22}{7} = f(-3)$$

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Graphing a Linear Function

Graph $f(x) = \frac{3}{4}x - 2$ $y = mx + b$

1. Put in slope-intercept form.

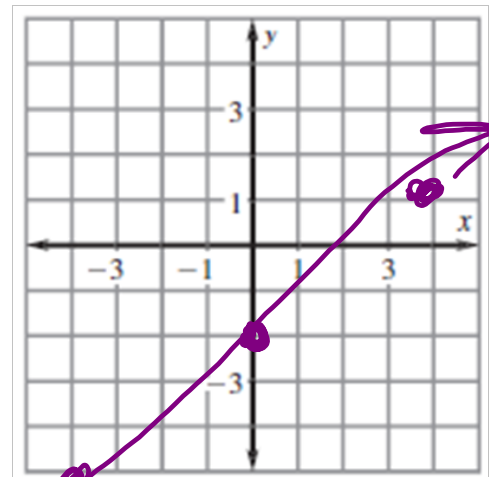
$$y = \frac{3}{4}x - 2$$

2. Identify the slope and y-intercept.

$$m = \underline{\frac{3}{4}} \quad b = \underline{-2}$$

← y-int

3. Plot the y-intercept and use the slope to find a second point. Connect.

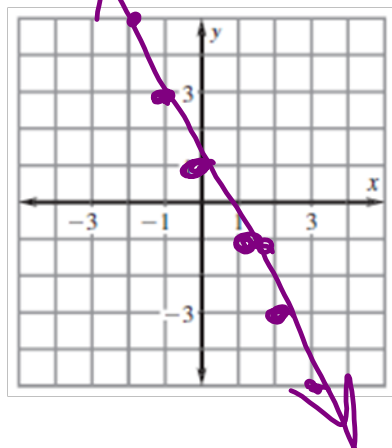


Try It Graph the following functions.

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

$$y = -2x + 1$$

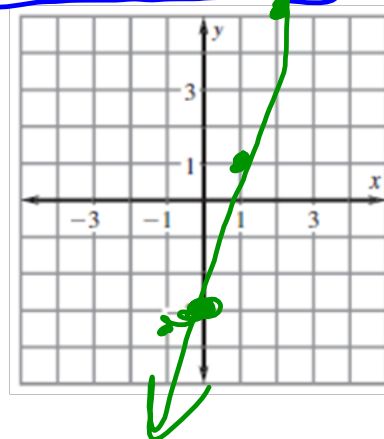
$$m = -2 \quad b = 1$$



b) $f(x) = 4x - 3$

$$y = 4x - 3$$

$$m = 4 \quad b = -3$$



Finding the slope of the graph of a linear function.

$$f(9) = -1, \quad f(-1) = 2$$

$$(9, -1)$$

$$(-1, 2)$$

1. Identify x_1, x_2, y_1, y_2

2. Use the formula for slope and substitute in the values.

$$m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 2}{9 - (-1)} = \frac{-3}{10}$$

$$\frac{0}{s} = \text{horizontal}$$

horizontal

$$\frac{s}{0} = \text{undefined}$$

vertical

Try It

$$f(-3) = -9, f(3) = 9$$

$$\begin{array}{l} (-3, -9) \\ (3, 9) \end{array}$$

$$m = \frac{-9 - 9}{-3 - 3} = \frac{-18}{-6}$$

$$m = 3$$

$$f(2) = -3, f(-2) = 5$$

$$\begin{array}{l} (2, -3) \\ (-2, 5) \end{array}$$

$$m = \frac{-3 - 5}{2 - (-2)} = \frac{-8}{4}$$

$$m = -2$$

Summary

EQ: How can you tell if an equation is a function?

- Passes VLT
- For every x there is only one y

4.8 Day 2 Homework

Yesterday's HW: p.259 #12-28even

p.260 #29-31, 32-40even, 42-49

$f(x) = 3x + 5$
 $y = 3x + 5$
 $m =$
 $b =$

$m = ?$
 $b = ?$

G. Paper
 $y = mx + b$
 $m = ?$
 $b = ?$

(x, y)
 $(,)$
 $m =$