Relation (2,5) (3,3) (4,2)

Algebra 1 1.7 (3,7)

Determine whether a relation is a function.

Find function values

relation (x, y)

function specific every x has one partner

discrete

continuous

vetical line test

cut & paste activ

Every input has exactly one output!

X Y

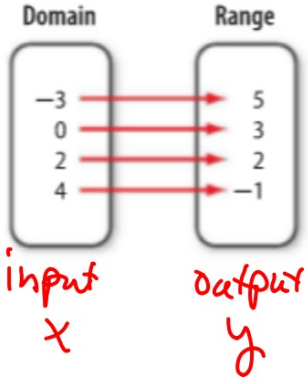
KeyConcept Function

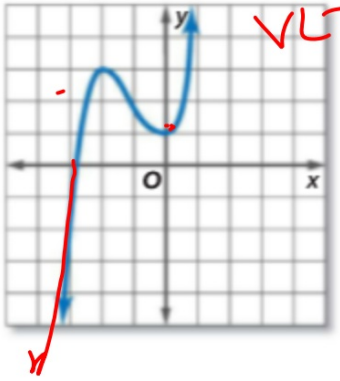
Words A function is a relation in which each element of the domain is paired with *exactly* one element of the range.

Vertical line test

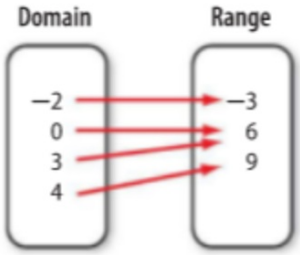
VLT

Examples





a.



$(-2, -3)$
$(0, 6)$
$(3, 6)$
$(4, 9)$

X

b.

Domain	1	3	5	1
Range	4	2	4	−4

Guided Practice

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

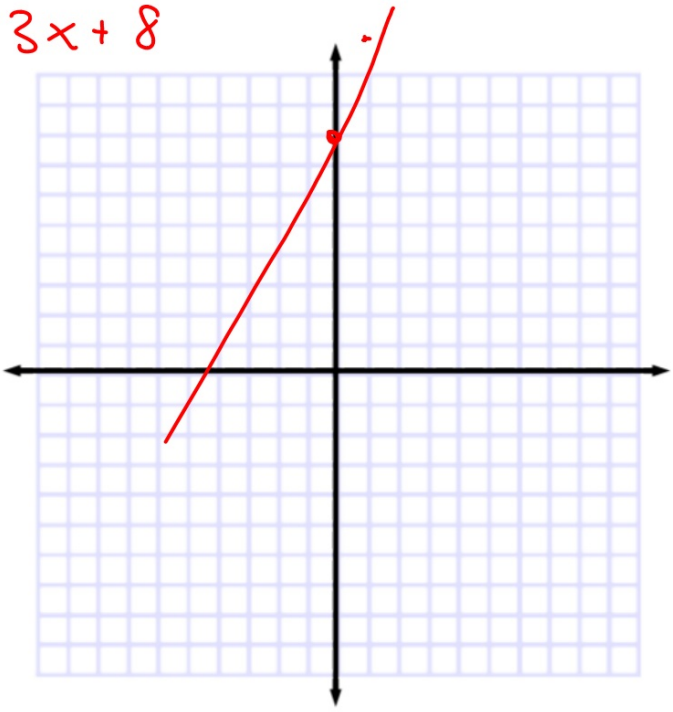
Example 3 Equations as Functions

Determine whether $-3x + y = 8$ is a function.

$+3x \quad +3x$

$y = mx + B$

$y = 3x + 8$



GuidedPractice Determine whether each relation is a function.

3A. $4x = 8$

$\frac{4}{4} \quad \frac{}{4}$

$x = 2$

no

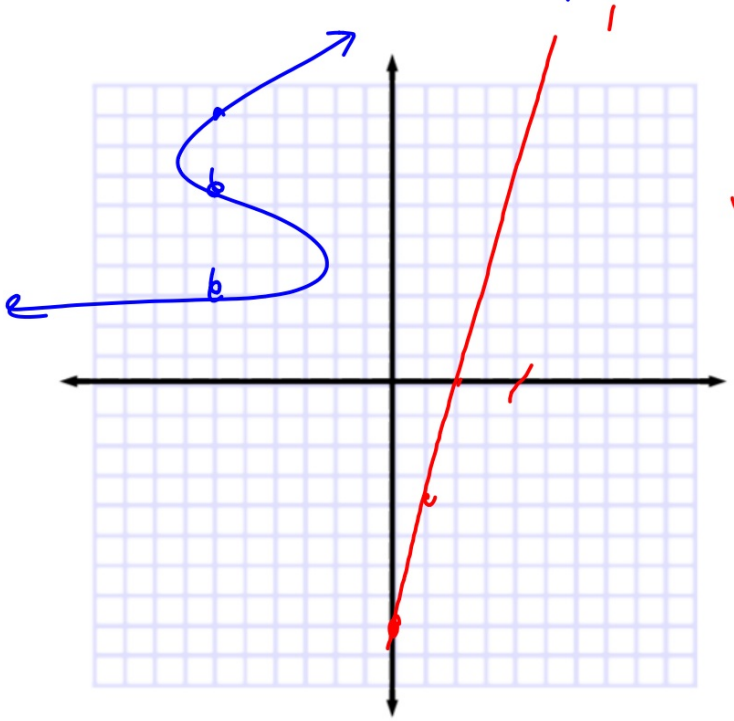
3B. $4x = y + 8$

$-8 \quad -8$

$4x - 8 = y$

$\frac{}{1}$

yes

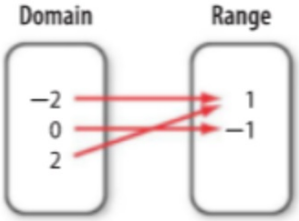
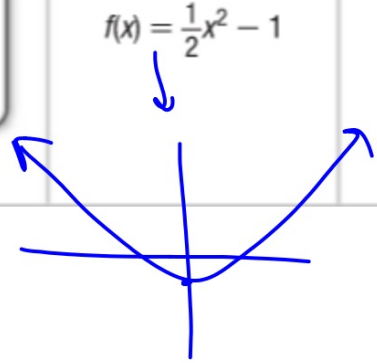
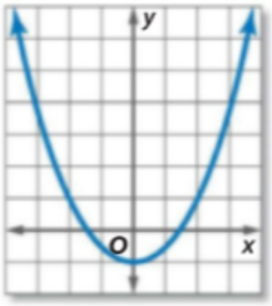


VLT

yes { Same vertical only only crosses once

fn.

ConceptSummary Representations of a Function

Table	Mapping	Equation	Graph
			

$f(x) = \frac{1}{2}x^2 - 1$

Cindy $y = 2x + 5$

$f(x) = 2x$

mrs.kroon $f(x) = 2x + 5$

2 Find Function Values

Equations that are functions can be written in a form called **function notation**. For example, consider $y = 3x - 8$.

Equation	Function Notation
$y = 3x - 8$	$f(x) = 3x - 8$

In a function, x represents the elements of the domain, and $f(x)$ represents the elements of the range. The graph of $f(x)$ is the graph of the equation $y = f(x)$. Suppose you want to find the value in the range that corresponds to the element 5 in the domain. This is written $f(5)$ and is read *f of 5*. The value $f(5)$ is found by substituting 5 for x in the equation.

Example 4 Function Values

For $f(x) = -4x + 7$, find each value.

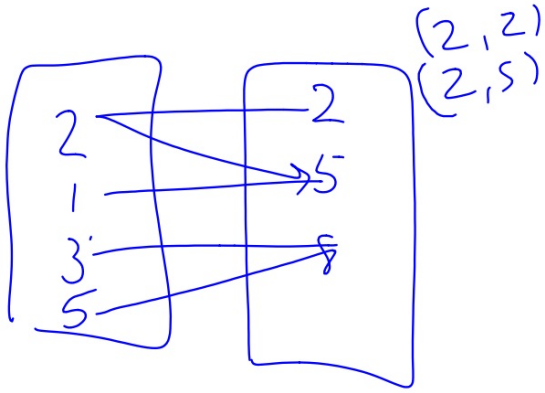
$f(x) = -4x + 7$

$f(2) = -4 \cdot 2 + 7 = -1$

$f(5) = -4 \cdot 5 + 7 = -13$

$f(0) = -4 \cdot 0 + 7 = 7$

$f(-1) = -4 \cdot -1 + 7 = 11$



(2, 2)
(2, 5)

3, 8
5, 8

GuidedPractice

For $f(x) = 2x - 3$, find each value.

4A. $f(1)$

4B. $6 - f(5)$

4C. $f(-2)$

4D. $f(-1) + f(2)$