

2.3- Introduction to Functions

Definition of Function

A **function** is a relationship between two variables such that each value of the first variable is paired with exactly one value of the second variable

The **domain** of a function is the set of all possible values of the first variable. The **range** of a function is the set of all possible values of the second variable.

x	y
2	2
4	3
6	4
8	5

Function

x	y
3	4
3	5
5	-4
6	3

Not a
Function

x	y
1	5
2	5
3	7
4	8

Function

Vertical-Line Test

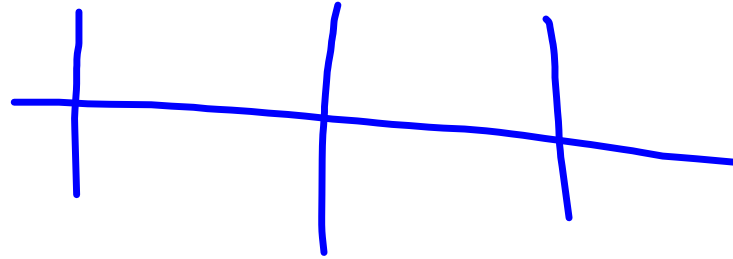
If every vertical line intersects a given graph at no more than one point, then the graph represents a function.

Vertical Line

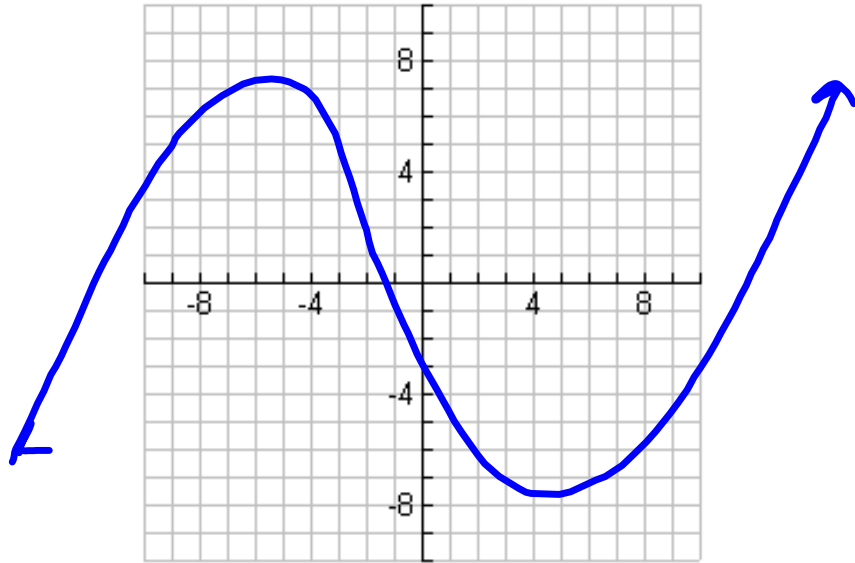


Not a
Function

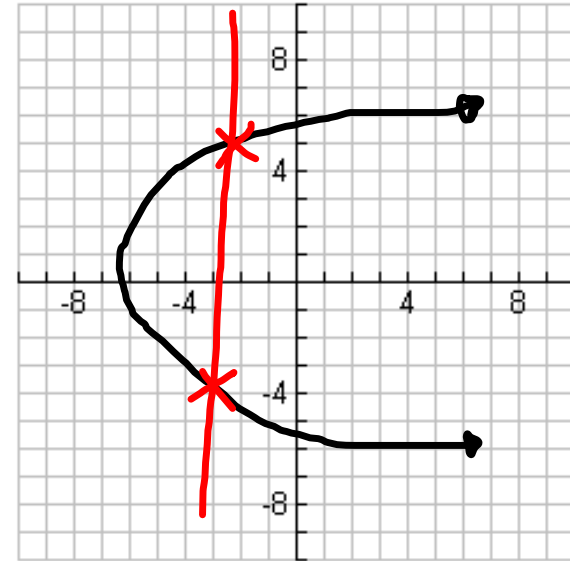
Horizontal Line



Function



Function



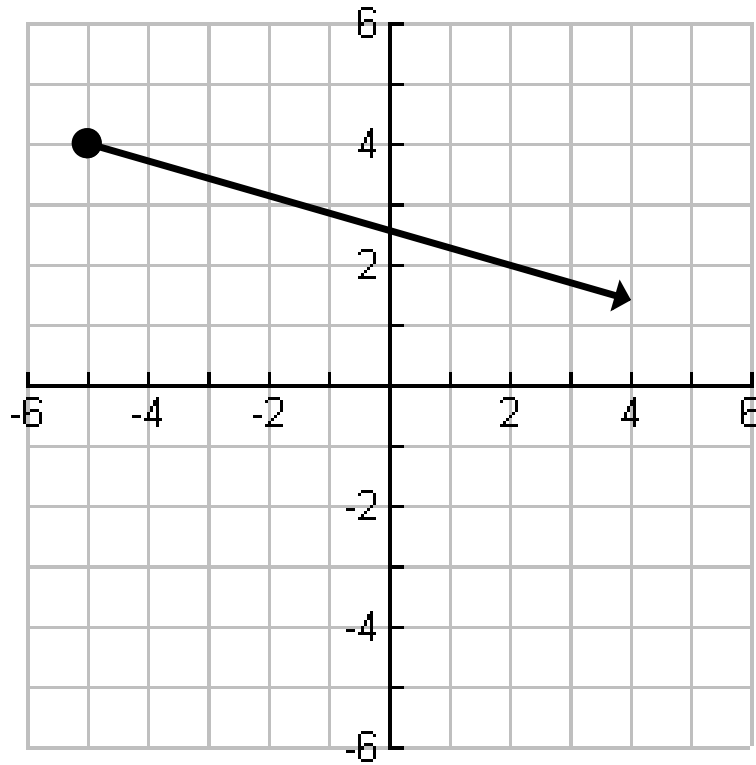
Not a
Function

Definition of Relation

A relationship between two variables such that each value of the first variable is paired with one or more values of the second variable is called a **relation**.

The **domain** is the set of all possible values of the first variable. The **range** is the set of all possible values of the second variable.

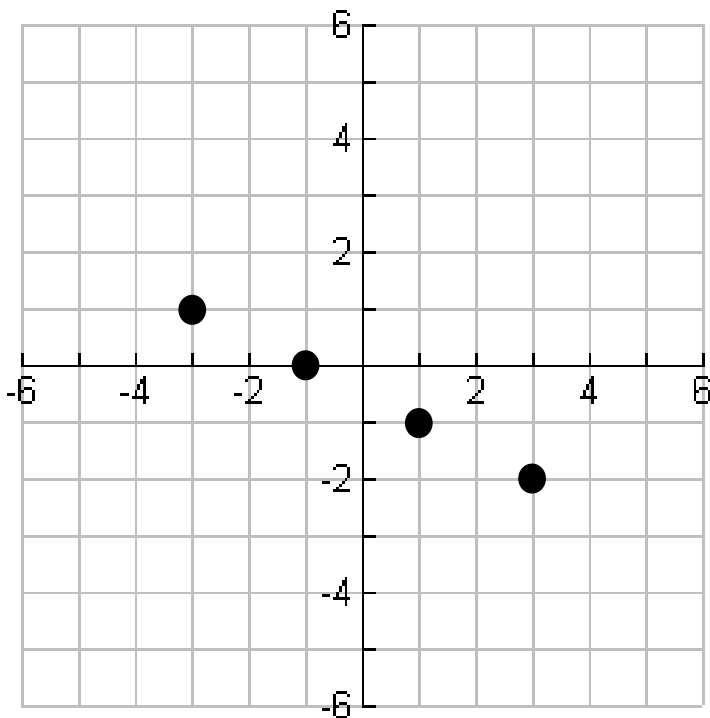
State the domain and range of each function graphed.



Domain
 $x \geq -5$

Range
 $y \leq 4$

State the domain and range of each function graphed.



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

Domain: $\{-3, -1, 1, 3\}$

Range: $\{-2, -1, 0, 1\}$

Function Notation

If there is a correspondence between values of the domain, x , and values of the range, y , that is a function, then $y = f(x)$, and (x, y) can be written as $(x, f(x))$. The notation $f(x)$ is read " f of x ." The number represented by $f(x)$ is the value of the function f at x .

The variable x is called the **independent variable**. The variable y , or $f(x)$, is called the **dependent variable**.

Given $f(x) = 2x - 6$, solve for $x = 1$.

$$\begin{aligned} f(1) &= 2(1) - 6 \\ &= 2 - 6 \end{aligned}$$

$$f(1) = -4$$

Given $f(t) = t^2 - 3$, find the indicated function value.

$$f(\sqrt{2}) = (\sqrt{2})^2 - 3$$

$$= 2 - 3$$

$$f(\sqrt{2}) = -1$$

Quiz - Tomorrow

2.1-2.3

Homework

Pg. 108-109 #16-40 even, 46-50 even, 62, 64-66 all