PreCalculus Name: Period: Date:

Warm Up 9/5

Lesson 2-2: Graphs of Functions

Objective

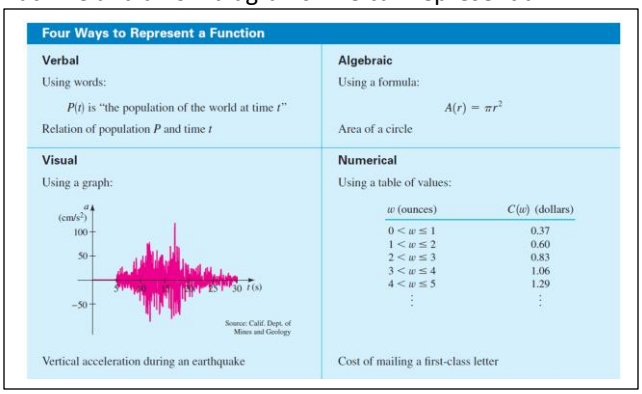
Students will…

- Be able to make a table of values for a given function.
- Be able to graph each function using its table of values.
- Be able to determine the domain and the range of each function from its graph.

Four Ways of Representing a Function

To help us understand what a function is, we have used machine and arrow diagrams. We can represent a functional relationship in following ways:

1. _____ (by a description in words)
2. _____ (by an explicit formula)
3. _____ (by a graph)
4. _____ (by a table of values)



Functions and their Graphs

If f is a function with domain A, then the graph of f is the set of ordered pairs: { }

In other words, the graph of f is the set of all points (x, y) such that $y = f(x)$; that is, the graph of f is the graph of the equation $y = f(x)$.

Hence, we can place each input and output as an ordered pair, namely, (_____, _____).

Table of Values

Thus, we can graph every function the way we first learned how to graph- by making a table of values. Consider the following functions:

$f(x) = x^2$ $g(x) = x^3$ $h(x) = \sqrt{x}$

Graphing Functions

x	$f(x) = x^2$
0	0
$\pm\frac{1}{2}$	$\frac{1}{4}$
± 1	1
± 2	4
± 3	9

x	$g(x) = x^3$
0	0
$\frac{1}{2}$	$\frac{1}{8}$
1	1
2	8
$-\frac{1}{2}$	$-\frac{1}{8}$
-1	-1
-2	-8

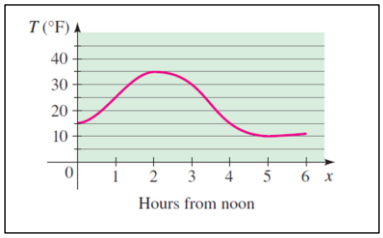
x	$h(x) = \sqrt{x}$
0	0
1	1
2	$\sqrt{2}$
3	$\sqrt{3}$
4	2
5	$\sqrt{5}$

Getting Information from the Graph

The values of a function are represented by the y-coordinates of its graph. So, we can read off the values of a function from its graph.

Ex. The function T graphed gives the temperature between noon and 6 P.M. at a certain weather station.

a. Find $T(1)$, $T(3)$, $T(5)$.

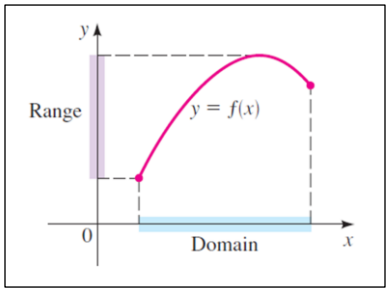


b. Which is larger, $T(2)$ or $T(4)$?

Domain and Range from Graphs

You can also determine the _____ and the _____ of functions from their graphs. Remember that domain is all possible x-values, while the range is the all possible y-values. So, from the graph the domain is always from the lowest _____ to the highest _____. Likewise, the range is from the **lowest y-coordinates** to the highest **y-coordinates**.

Ex.

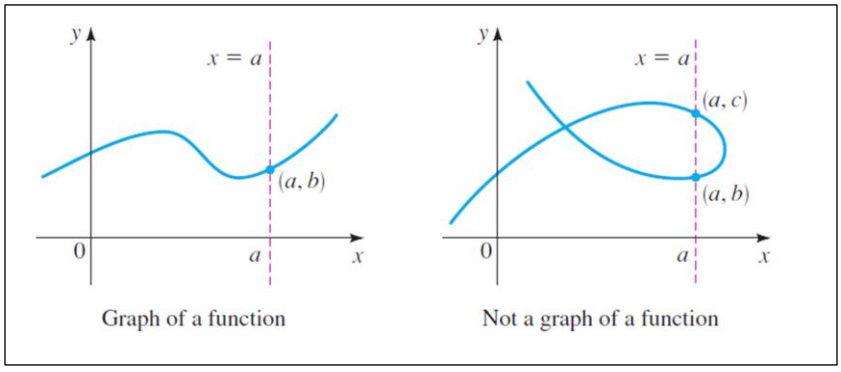


Vertical Line Test

Remember that in a function, for every input there is exactly one output. Graphically this means that for every x-value there must be only one y-value. Thus, a **_____test** can be used on a graph of any given expression to determine whether it is a function.

Vertical Line Test- A curve in the coordinate plane is the graph of a function if and only if no vertical line intersects the curve **more than _____**.

Ex.



Homework 9/5

TB pg. 167-169 #1, 4, 6, 11, 23, 24, 57-60