NOTES U1B L2 SLOPE and RATE of CHANGE Name: _____HR:_____

UNIT 1B
Lesson 2

TARGET SKILL(s): Calculate slope and rate of change

Review:

▶ $f(x)$ is the OUTPUT when the INPUT is x

▶ If $f(x) = 2x + 5$, then the $f(3) =$ _____

$f(-3) =$

$f(x + 4)$

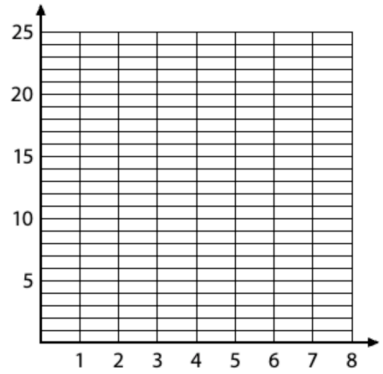
An internet provider charges a $7 access fee plus $2.50 per gigabyte of data downloaded.

Let T = the total charges for using the service

Let g = the number of gigabytes downloaded

Create a mathematical model of the situation.

Write the function $T(g) =$



SLOPE (also called rate of change):

☆Describes how _____ a line is

☆The **sign** of the slope indicates direction

☆Can be counted as $\frac{\text{Rise}}{\text{Run}}$ the $\frac{\text{change in y}}{\text{change in x}}$

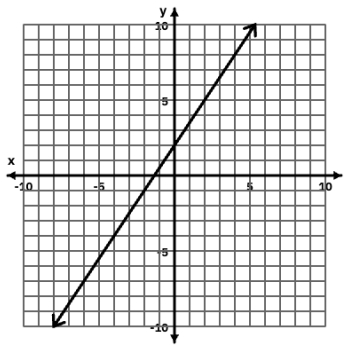
☆ m = symbol for slope

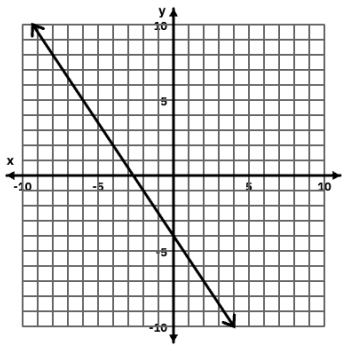
▶ Domain and range:

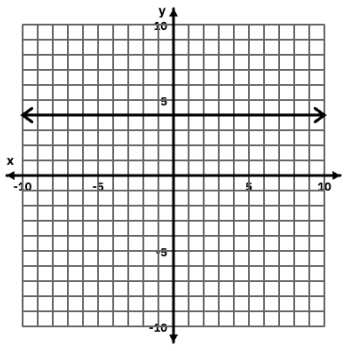
Domain is the set of possible inputs;

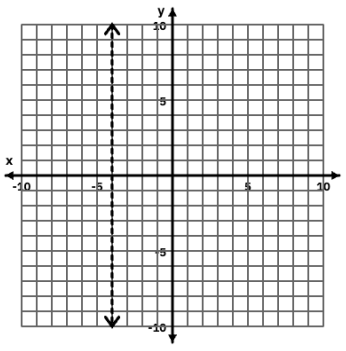
Range is the set of possible outputs.

Determining the slope of a line from a graph









U1B L2 SLOPE and RATE of CHANGE Name: _____HR:_____

FORMULA: The slope (m) between points (x_1, y_1) and (x_2, y_2)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Directions: Find the slope of the line that passes through the two points.

$(-3,2)$ and $(5,6)$	$(1,-5)$ and $(4,7)$	$(2,8)$ and $(5,2)$	$(4,2)$ and $(4,7)$	$(-3,5)$ and $(2,5)$	$(1,3)$ and $(4,9)$

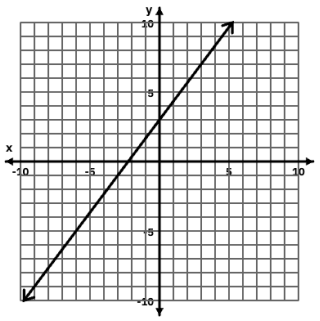
RATE of CHANGE and AVERAGE RATE of CHANGE: Tell us quickly one value changes compared to another value.

▶ For linear functions (lines: $f(x) = mx + b$) rate of change is constant and called SLOPE

▶ Formula for AVERAGE RATE OF CHANGE between $x_1 = a$ and $x_2 = b$ is

Average rate of change $= \frac{f(b) - f(a)}{b - a}$ or

R.O.C. (Slope): Can be found from an EQUATION, a TABLE of VALUES, or a GRAPH.

EQUATION: If $f(x) = x^2 - 4$ find the average rate of change from $x = 1$ to $x = 4$	**TABLE:** Use the table to find the average rate of change from $x = 1$ to $x = 3$ x | $f(x)$ 0 | 3 1 | 5 2 | 9 3 | 15	**GRAPH:** Use the graph to find the average rate of change from $x = 0$ to $x = 4$ 
A plant's height $H(t)$ in centimeters after t weeks is given by $H(t) = 2t + 5$. Find the growth rate between $t = 2$ and $t = 6$ weeks.	A toy car's position in meters as a function of time is $p(t) = -4t^2 + 12t$. Find the average rate of change from t = 0 seconds to t = 1 second.	Water drains from a tank so that $V(t) = 100 - 5t$ liters after t minutes. Find the average rate of change from t = 4 to t = 7 minutes.