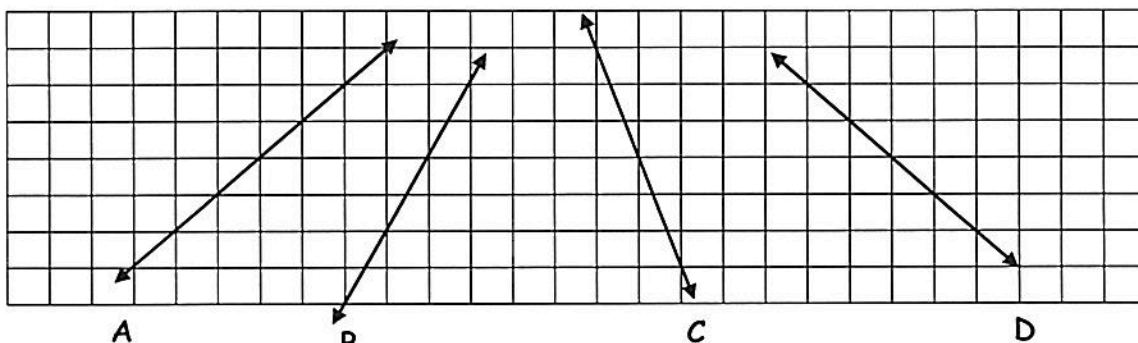**Essential Question:** How do we determine the slope of a linear function?

Do Now: Consider the graphs of the linear functions below. Order the graphs from *most steep* to *least steep* by writing the letters on the line below. Be ready to justify your response.
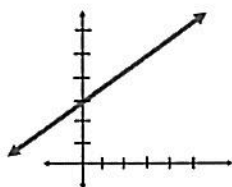
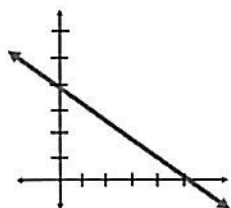A   B   C   D

_____C , B , A/D_____

Linear Functions and Slope

Slope is a number (*ratio*) that describes the ___steepness___ or ___slant___ of a line. It is
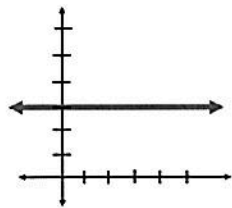
the constant ___rate of change___.

Types of Slope

___positive___   ___negative___   ___zero___   ___no slope___
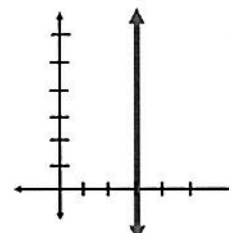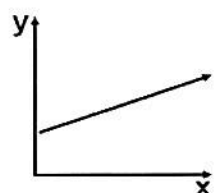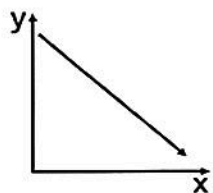   (undefined)
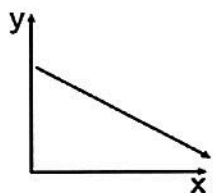
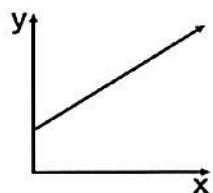Classify the following slopes as **POSITIVE** or **NEGATIVE**.
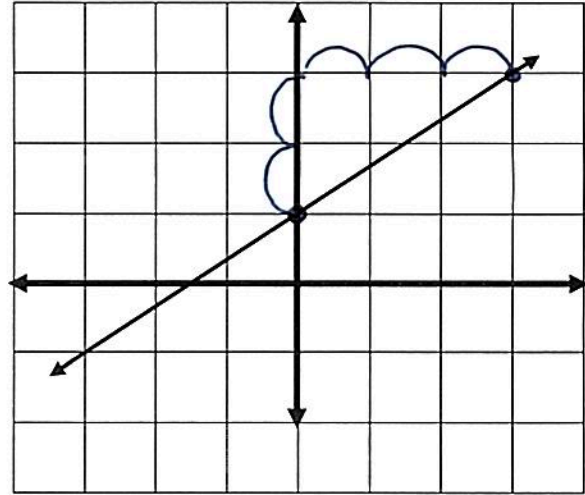
positive   negative   negative   positive

Think about...

Is the function increasing or decreasing?   'read' a graph from left to right

How can we calculate the slope from a graph?

1) Determine if the function is increasing or decreasing.

2) Locate any two points on the line.

3) Calculate the Rise (Δy) and Run (Δx) between the two points.

4) Create a ratio ($\frac{rise}{run}$). $\frac{2}{3}$

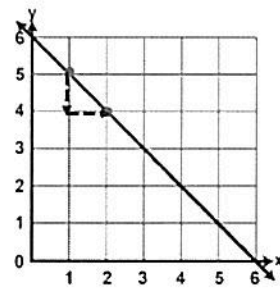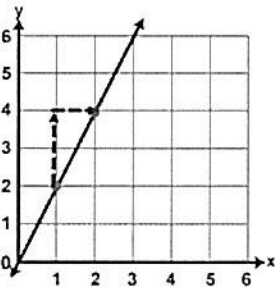### How can we find the slope of a line from two points on the line?

1) Choose any two points on the line.

2) Calculate the slope using the slope formula:

Slope Formula $= \dfrac{\Delta y}{\Delta x} = \dfrac{difference \ in \ y-values}{difference \ in \ x-values}$

Find the slope of each line.

$\frac{2}{1}$

$\boxed{2}$

$\frac{-1}{1}$

$\boxed{-1}$

Choose one of the graphs pictured to the left and using the slope formula, verify that you calculated the correct rate of change for the linear relationship.

$\frac{-1}{2}$

$\boxed{-\frac{1}{2}}$

$\boxed{\frac{1}{2}}$

pick 2 points
(2,2) (4,3)

use $\frac{\Delta y}{\Delta x}$ to find slope

$\dfrac{2-3}{2-4} \rightarrow \dfrac{-1}{-2} \rightarrow \dfrac{1}{2}$

TAKE AWAY

The **constant rate of change** of a linear relationship is known as the _____ slope _____ of the line.

The **slope** is the ratio of _____ rise _____ to _____ run _____ for any two points on the line.

The **slope formula** is $\dfrac{\Delta y}{\Delta x} = \dfrac{difference \ in \ y \ values}{difference \ in \ x \ values} = \dfrac{y_2 - y_1}{x_2 - x_1}$