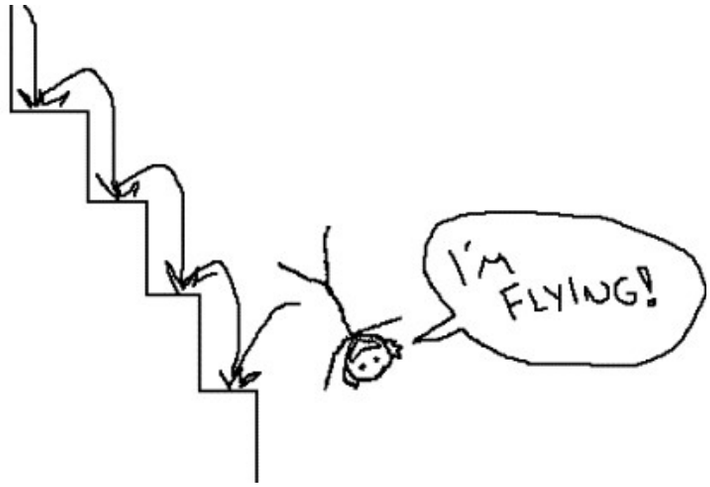
Rate of Change and Slope



Ratio: A way to compare two values. In math, usually ratios are fractions.

Slope: The ratio of the change in your y-value and the change in your x-value.

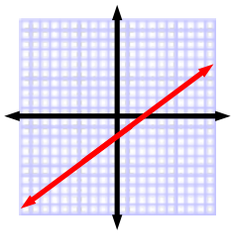
Slope is described as $\frac{\Delta Y}{\Delta X}$ → $\frac{y_2 - y_1}{x_2 - x_1}$

Δ ← This is the delta symbol. It means change.

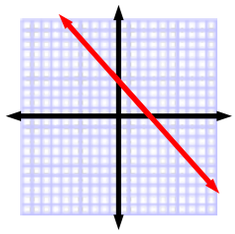
So, slope is $\frac{\text{the change in y}}{\text{the change in x}}$

You can find the slope by figuring out how much the x and y values changed.

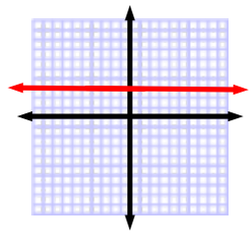
There are 4 kinds of slope:



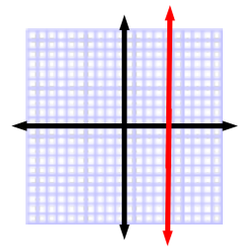
Positive



Negative



Zero



Undefined or

~~No Slope~~

No slope
is a slope

Examples

Find the slope between the following points

1. (-4, 3) and (4, 6)

$\frac{\Delta y}{\Delta x} = \frac{3}{8}$

2. (-3, 4) and (4, -8)

$\frac{\Delta y}{\Delta x} = \frac{-12}{7}$

3. (7, -5) and (10, -2)

$\frac{\Delta y}{\Delta x} = \frac{-2 - -5}{10 - 7} = \frac{3}{3} = 1$

$\frac{-5 - -2}{7 - 10} = \frac{-3}{-3} = 1$

4. (7, 5) and (-9, 5)

$\frac{\Delta y}{\Delta x} = \frac{0}{-16} = 0$

5. (-2, 6) and (-2, -3)

$\frac{\Delta y}{\Delta x} = \frac{-9}{0} =$ Undefined

Slope from Tables

6. Find the rate of change (slope) from the tables below

a.

Amount of Flour x (cups)	Pancakes y
2	12
4	24
6	36

2 (12)
2 (12)

$\frac{\Delta y}{\Delta x} = \frac{12}{2} = 6$

b.

Time x (hours)	Amount earned y (dollars)
8	62
12	93
20	155
35	271.25

4 (31)
8 (62)
15 (116.25)

$\frac{\Delta y}{\Delta x} = \frac{\$31}{4 \text{ hrs}} = 7.75$

$\frac{62}{8} = 7.75$

$\frac{116.25}{15} = 7.75$

$7.75 per hour

7. Complete the table so that the function is linear

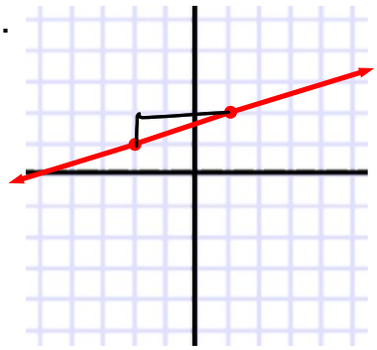
Linear → Has a Slope

x	y
11	-5
8	-3
5	-1
2	1
-1	3

-3, -3, -3, -3 | 2, 2, 2, 2

Find the slope of the following graphs $\frac{\text{Rise}}{\text{Run}} = \frac{\Delta y}{\Delta x}$

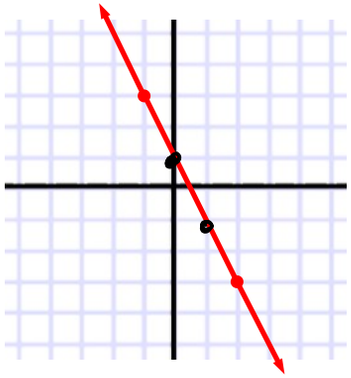
8.



$\frac{1}{3}$

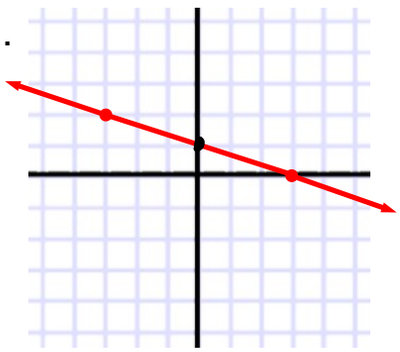
$\frac{3}{4}$

10.



$\frac{-6}{3} = \frac{-2}{1}$

11.



$\frac{-2}{6} = \frac{-1}{3}$