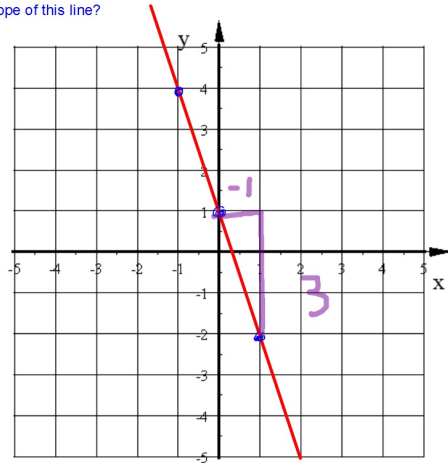


Sec 6-1: Slope and Rate of Change

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{\text{Vertical Change}}{\text{Horizontal Change}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

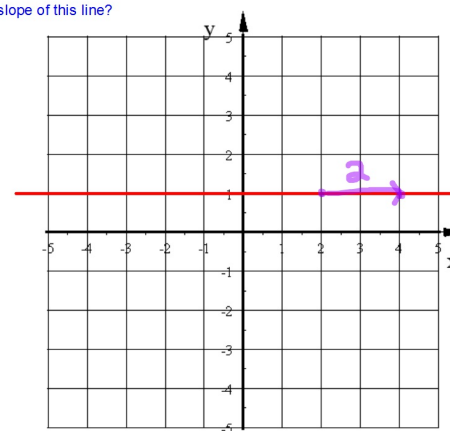
What is the slope of this line?



$$m = \frac{3}{-1}$$

$$m = -3$$

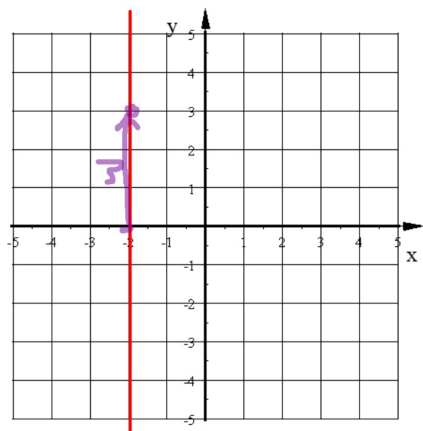
What is the slope of this line?



$$m = \frac{0}{2} = 0$$

has a run but no rise

What is the slope of this line?



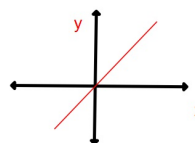
$$m = \frac{3}{0}$$

$m = \text{undefined}$

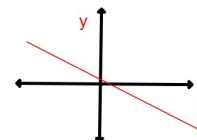
has a rise but no run

What are the four different kinds of slope?

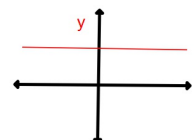
Positive



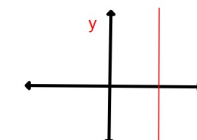
Negative



Zero



Undefined



The larger the slope, the steeper the line

larger pos  
or larger neg.

The closer the slope is to zero the flatter the line is.

Put the slopes in order from steepest to flatest.

$$-2, 0.8, \frac{7}{3}, -9, 6.4, -\frac{1}{7}, -2.5$$

Steepest

Flatest

$$-9, 6.4, -2.5, \frac{7}{3}, -2, 0.8, -\frac{1}{7}$$

Take absolute value then put the numbers in descending order

$$\text{Rate of Change} = \frac{\text{Change in the Dependent Variable}}{\text{Change in the Independent Variable}}$$

$$\text{Rate of Change} = \frac{\Delta Y}{\Delta X} \quad \text{Slope with units}$$

Since the phrase Rate of Change applies when using "REAL" data you'll be expected to give units with your answer.

Find the rate of change. Given decimals answers to the nearest tenth.

1 Calories burned while jogging

# Minutes	# Calories burned
2	52
3	78
4	104
5	130
6	156

$$78 - 52 = 26$$

$$\frac{26}{1} = 26 \text{ cal/min}$$

2 Cost of Renting a Trailer

# hours	Rental Cost
3	\$95
5	\$125
7	\$155
9	\$185
11	\$215

$$\frac{215 - 95}{11 - 3} = \frac{120}{8} = 15$$

$$15 \text{ \$ / hr}$$

3 # Minutes remaining in the book

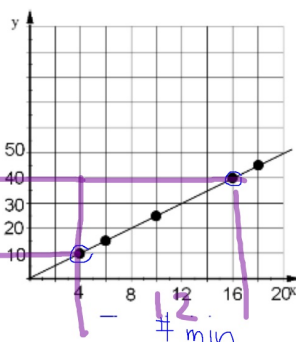
# Minutes	# Pages Remaining
4	571
8	566
20	551
24	546
30	538.5

$$\frac{551 - 566}{20 - 8} = \frac{-15}{12}$$

$$= -1.25 \text{ pg remain / min}$$

4

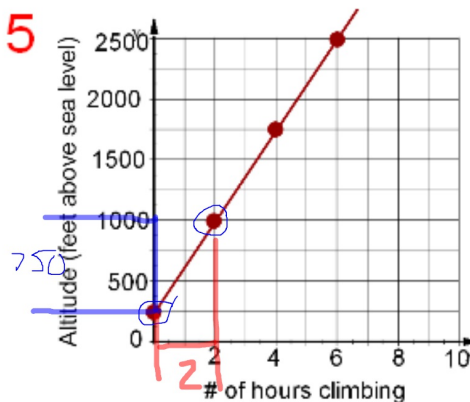
# Bricks Layed



$$\frac{30 \text{ Bricks}}{12} = 2.5 \text{ Bricks / min}$$

$$2.5 \text{ Bricks / min}$$

5



$$\frac{1000}{2} = 500$$

$$500 \text{ ft / hr}$$

If the rate of change is constant  
then what will the graph of the data  
look like?

A linear function