

3.1  
36

$$5x + 2y = 10$$

Find x-int, y-int

Graph

x-int

$$y = 0$$

$$5x + 2(0) = 10$$

$$\frac{5x}{5} = \frac{10}{5}$$

$$x = 2$$

$$(2, 0)$$

54.  $4y = 3x$

x-int

$$y = 0$$

$$4(0) = 3x$$

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

$$0 = x$$

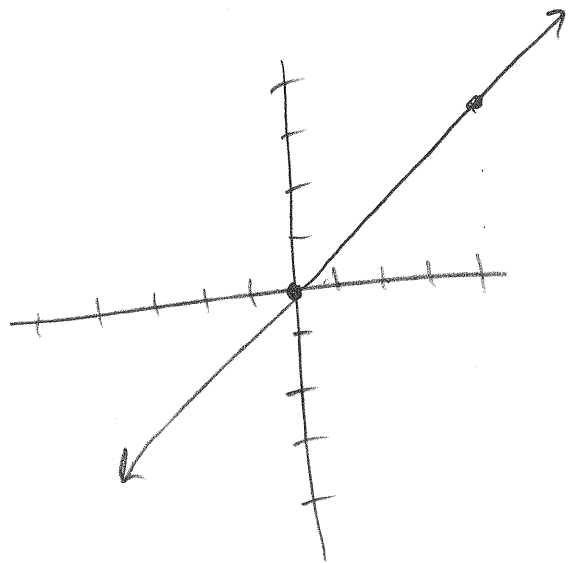
$$(0, 0)$$

y-int

$$x = 0$$



$$(0, 0)$$



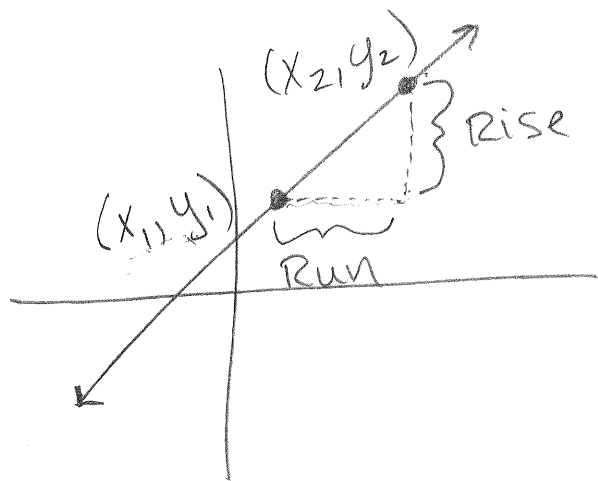
Pick:  $x = 4$   
 $(4, 3)$

$$\frac{4y}{4} = 3 \cdot \frac{4}{4} \quad y = 3$$

## Sec 3.2 the slope of a Line

Slope = a measure of  
Steepness

can be given as  
a percent, a decimal, a fraction



$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{\text{change in } y}{\text{change in } x}$$

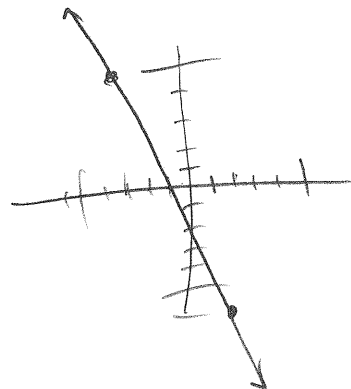
6% grade for road

$$6\% = 0.06 = \frac{6}{100}$$

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

Ex: Find slope through  $(2, -6)$  and  $(-3, 5)$

$$m = \frac{5 - (-6)}{-3 - 2} = \frac{11}{-5} = \boxed{-\frac{11}{5}}$$



$$3x - 4y = 12$$

find the intercepts

x-int

$$y = 0$$

$$3x - 4(0) = 12$$

$$\frac{3x}{3} = \frac{12}{3}$$

$$x = 4$$

$$(x_1, y_1) = (4, 0)$$

y-int

$$x = 0$$

$$3(0) - 4y = 12$$

$$\frac{-4y}{-4} = \frac{12}{-4}$$

$$y = -3$$

$$(x_2, y_2) = (0, -3)$$

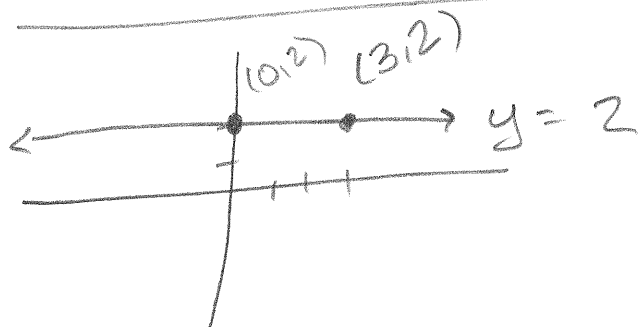
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{-3 - 0}{0 - 4}$$

$$= \frac{-3}{-4}$$

$$= 3/4$$

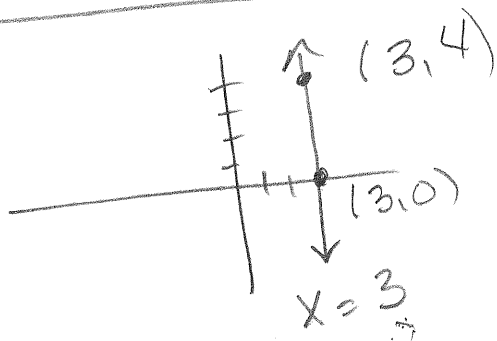
Horizontal Lines:  $m = 0$



$$m = \frac{2 - 2}{3 - 0} = \frac{0}{3}$$

$$= 0$$

Vertical Lines: Slope is undefined



$$m = \frac{4 - 0}{3 - 3} = \frac{4}{0}$$

undefined

Recall for  $3x - 4y = 12$ ,  $m = \frac{3}{4}$

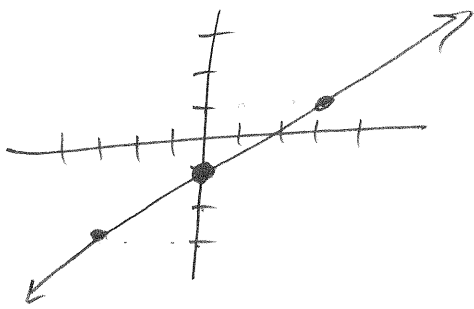
Lets solve for  $y$

$$\begin{array}{r} 3x - 4y = 12 \\ -3x \quad -3x \end{array}$$

$$\frac{-4y}{-4} = \frac{-3x + 12}{-4}$$

$$y = \boxed{\frac{3}{4}}x - 3$$

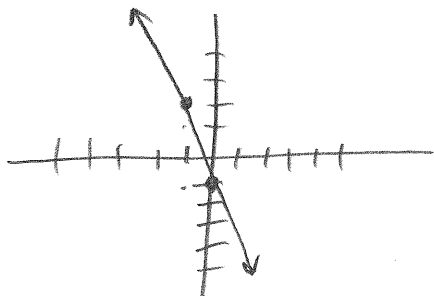
Graph the line:  $m = \frac{2}{3}$ , point at  $(0, -1)$



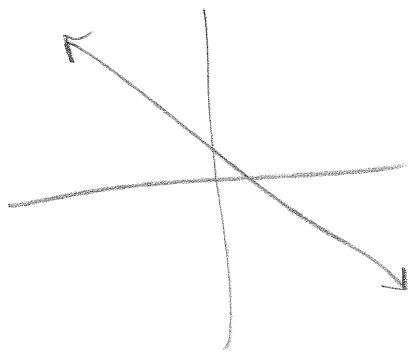
$$\frac{-2}{-3} = \frac{2}{3} \leftarrow \text{Rise}$$
$$\frac{-2}{-3} = \frac{2}{3} \leftarrow \text{Run}$$

1<sup>st</sup> plot the known point  
2<sup>nd</sup> find another point using the slope

Graph:  $m = -3$  Point:  $(-1, 2)$

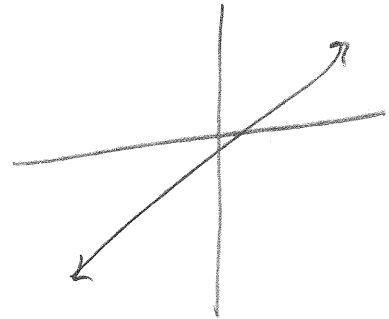


Negative Slope



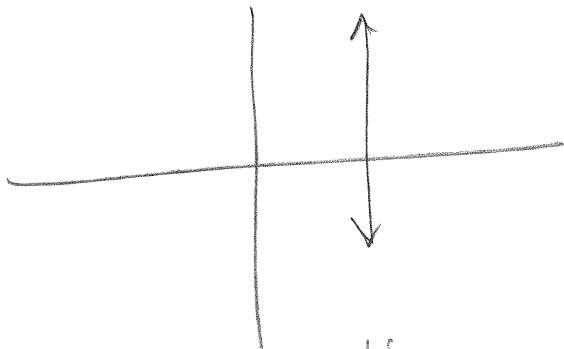
from left to right  
line falls

Positive Slope



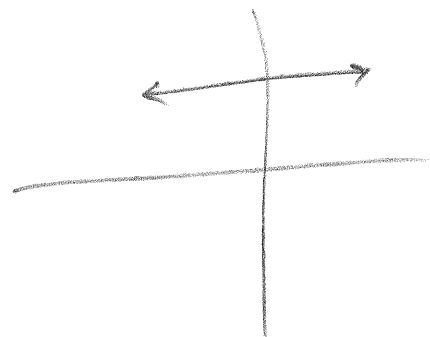
from left to right  
line rises

Undefined Slope



vertical line

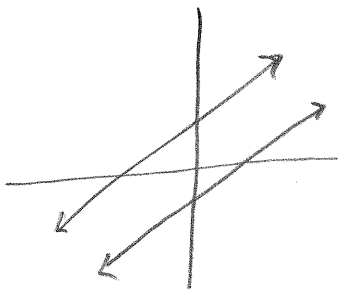
0 slope



horizontal line

Parallel Lines

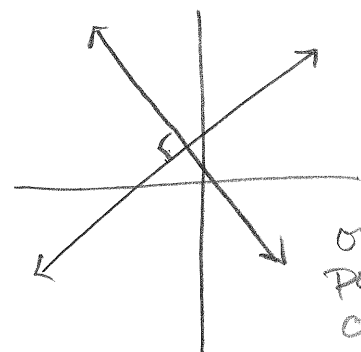
: Lines that  
never meet



Slopes  
are  
equal

Perpendicular  
Lines:

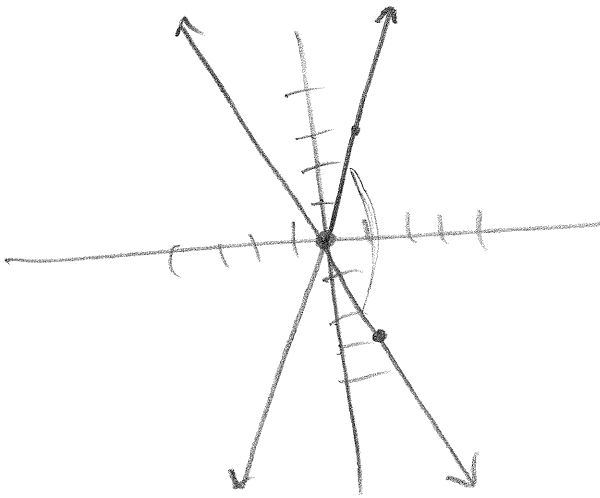
cross  
at  
right  
angles



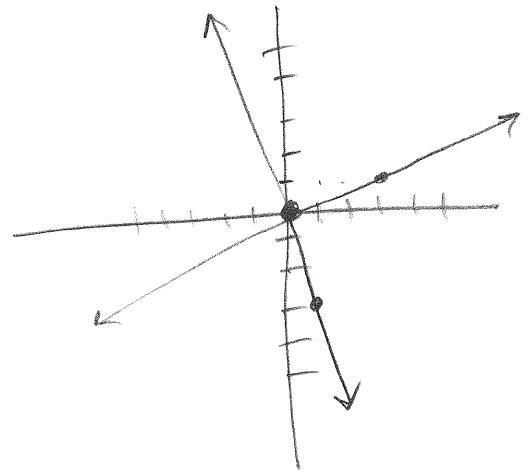
one  
positive  
one  
negative  
Reciprocals

Slopes are  
Negative Reciprocals

$$m = -3, m = 3$$



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



Determine if Parallel, perpendicular,  
or Neither

$$2y = 3x - 6 \quad \text{and}$$

Richfield



$$y = \frac{3}{2}x - 3$$

$$m = \frac{3}{2}$$

$$2x + 3y = -6$$

Ephraim



$$y = -\frac{2}{3}x - 2$$

$$m = -\frac{2}{3}$$

Same? No (not parallel)  
is 1 pos/1 neg? Yes  
are reciprocals? yes } Perpendicular!

Slope can be interpreted as  
"average rate of change"

Positive slope: Rate of increase

Negative slope: Rate of decrease