

Equations of Lines!

Slope

slope -
intercept
form

point -
slope
form

standard
form

rise
run

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

$$y = mx + b$$

m = slope

b = y-intercept
(where x=0)

$$y - y_1 = m(x - x_1)$$

(x_1, y_1)

$$Ax + By = C$$

A, B, + C are #'s
(coefficients)

A CANNOT be
negative or a
fraction!

Ex. $(3, 9)$ and $(3, -5)$
 x_1, y_1 x_2, y_2

$$m = \frac{-5 - 9}{3 - 3} = \frac{-14}{0} \leftarrow \text{undefined}$$

* graph is a vertical line at $x=3$

Ex. $(4, 7)$ and $(-2, 7)$
 x_1, y_1 x_2, y_2

$$m = \frac{7 - 7}{-2 - 4} = \frac{0}{-6} = 0$$

* graph of horizontal line at
 $y=7$

Ex. $(3, -4)$ and $(-1, -1)$

$$m = \frac{-1 - (-4)}{-1 - 3} = \frac{-1 + 4}{-4} = \frac{-3}{4}$$

* negative slope, down 3,
right 4, or up 3, left 4

Ex. $m=3, b=-5$

$$y = 3x - 5$$

Slope is $\frac{3}{1}$

y-int is $(0, -5)$

Ex. Line passes through

$(2, -3)$ with a slope of

$m=5$

$$y = mx + b$$

$$-3 = (5)(2) + b$$

$$-3 = 10 + b$$

$$-13 = b \rightarrow$$

$$y = 5x - 13$$

Ex. $(1, 7)$ and $(2, 4)$

$$m = \frac{4 - 7}{2 - 1} = \frac{-3}{1} = -3$$

$$y - 4 = -3(x - 2)$$

$$y - 7 = -3(x - 1)$$

Ex. $y = 5x - 13$

$$-5x - 5x$$

$$-5x + y = -13$$

A can't be -!

$$(-5x + y = -13)(-1)$$

$$5x - y = 13$$

$$A=5$$

$$B=-1$$

$$C=13$$

Ex. $y = -\frac{1}{2}x + 4$

$$+\frac{1}{2}x \quad -\frac{1}{2}x$$

$$\frac{1}{2}x + y = 4$$

$$(\frac{1}{2}x + y = 4)(2)$$

$$x + 2y = 8$$

$$A=1$$

$$B=2$$

$$C=8$$