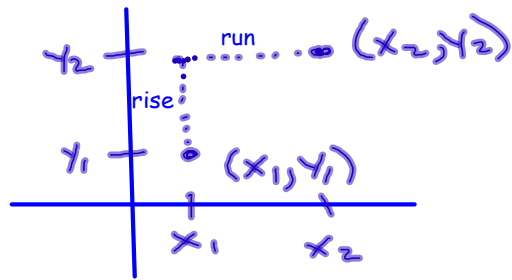


3.6 Parallel Lines in the Coordinate Plane

$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

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



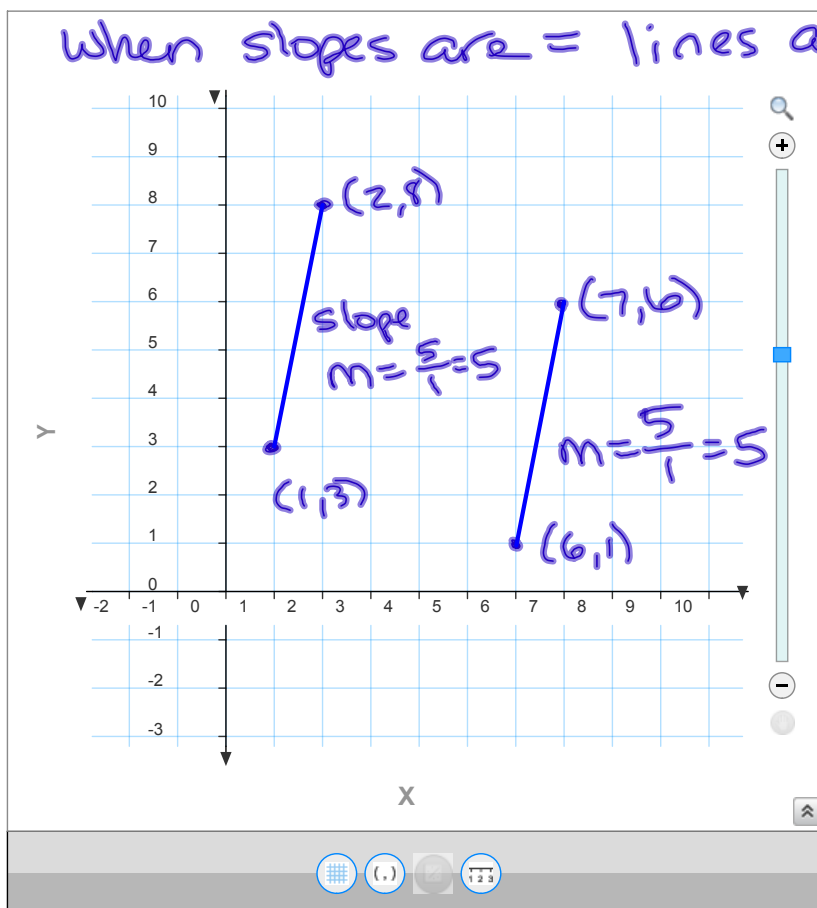
Ex 1 Find Slope

$$\begin{array}{cc} (-1, 2) & (4, 8) \\ x_1 \ y_1 & x_2 \ y_2 \end{array}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 2}{4 - (-1)} = \frac{6}{5}$$

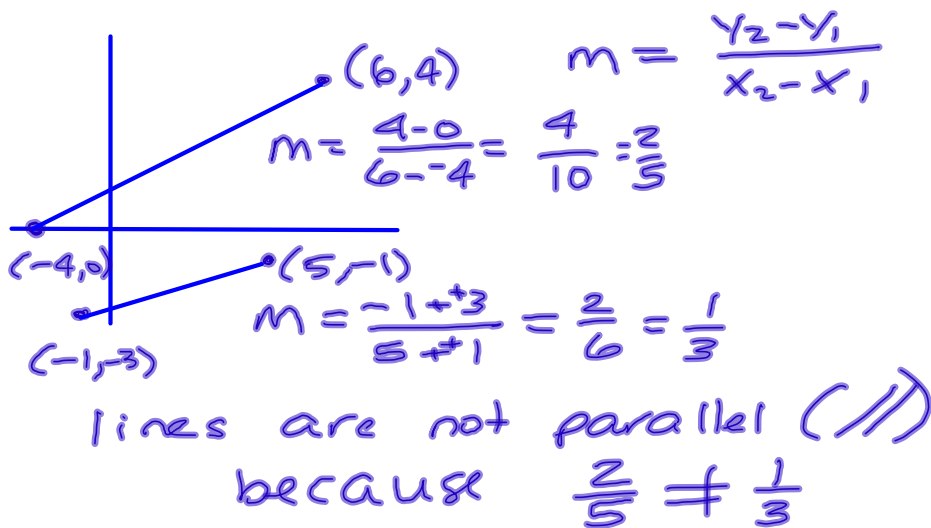
$$m = \frac{6}{5}$$

When slopes are = lines are //



When lines are parallel, their slopes are equal.

Ex 2 | Test the slopes and say if the lines are parallel



Equations of a line:

Slope - intercept form

$$y = \underset{\substack{\uparrow \\ \text{slope}}}{m}x + \underset{\substack{\uparrow \\ \text{y-intercept}}}{b}$$

Ex 3 | Compare equations

$$y = 2x - 4 \quad y = 2x + 12$$

$2 = 2$ $m = 2$ $m = 2$
parallel

$$y = \frac{1}{3}x - 4 \quad y = -\frac{2}{3}x - 4$$

$\frac{1}{3} \neq -\frac{2}{3}$ $m = \frac{1}{3}$ $m = -\frac{2}{3}$
not //

Ex 4 / write equation with slope & intercept
slope = 2 intercept = -3

① find m

$$m = 2$$

② find b

$$b = -3$$

③ plug into $y = mx + b$

$$y = 2x - 3$$

Ex 5 / write equation with slope and
a pass-through point

slope = -3 passes through $(-2, 5)$
x y

① find m

$$m = -3$$

② start the equation

$$y = -3x + b$$

③ plug in the point

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

④ solve for b

$$-1 = b$$

⑤ write $y = mx + b$

$$y = -3x - 1$$

Ex 6) write an equation that is // to another.

$$y = -\frac{1}{3}x - 1 \quad \text{pass through } (6, 4)$$

the new equation will look similar, but with a different b value

① use slope from $y = -\frac{1}{3}x - 1$

② start the equation

③ plug in the pass-through

④ solve for b

⑤ write $y = mx + b$

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

$$y = -\frac{1}{3}x + b$$

$$4 = -\frac{1}{3}(6) + b$$

$$4 = -2 + b$$

$$6 = b$$

$$y = -\frac{1}{3}x + 6$$

When both equations are graphed, the lines are parallel, but they cross the y axis at different places (that's why the b is different in each equation)

