M-A2 Algebra 2 Week 10 11/13

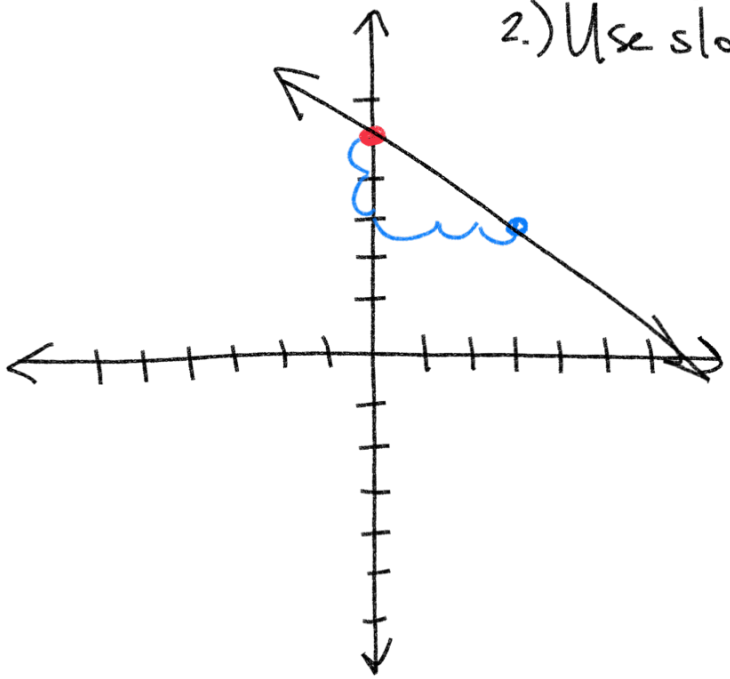
1.) Plot y-int
2.) Use slope

1.) $y = \boxed{-\frac{2}{3}}x \boxed{+ 5}$

$y = mx + b$

slope: m — y-int: b

slope = $\frac{-2}{3}$ $\frac{\text{down 2}}{\text{3 right}}$



2.) $2x - 5y = 10$ Standard Form

$Ax + By = C$

$2x - 5y = 10$ (0)

$x = 0$ $\quad -5y = 10$

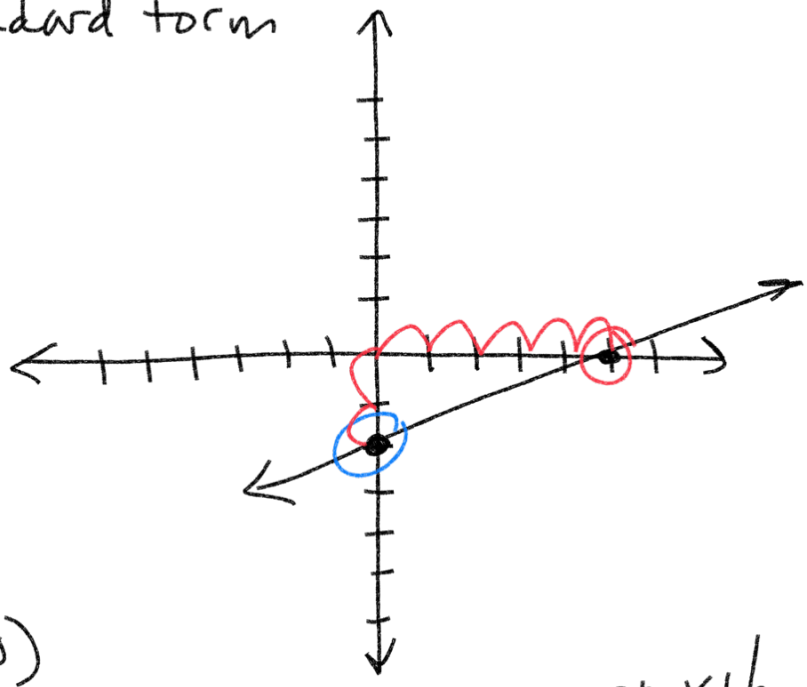
$\frac{-5y}{-5} = \frac{10}{-5}$

$y = -2$ (0, -2)

$2x - 5y = 10$ (0) (5, 0)

$y = 0$

$\frac{2x}{2} = \frac{10}{2}$ $\quad x = 5$



$2x - 5y = 10 \rightarrow y = mx + b$

$-2x \quad -2x$

$\frac{-5y}{-5} = \frac{-2x}{-5} + \frac{10}{-5}$

$y = \boxed{\frac{2}{5}}x \boxed{-2}$

Find the slope between

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

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-6-3}{5-2} = \frac{-9}{3} = \boxed{-3}$$

$$= \frac{3-(-6)}{2-5} = \frac{3+6}{2-5} = \frac{9}{-3} = \boxed{-3}$$

Find the equation for the line:

$m = 4 \qquad (-2, 6)$

① Point-Slope Form

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

$$y - 6 = 4(x - (-2))$$

$$y - 6 = 4(x + 2)$$

$$y - 6 = 4x + 8$$

$$+6 \qquad +6$$

$$\boxed{y = 4x + 14}$$

② Slope-Intercept form

$$y = mx + b$$

$$6 = 4(-2) + b$$

$$6 = -8 + b$$

$$+8 \qquad +8$$

$$14 = b$$

$$\boxed{y = 4x + 14}$$

Find the equation for a line:

(4, -2) and (6, -8)

1) Find slope

2.) Find equation

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

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

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

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

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

$$y + 2 = -3x + 12$$

$$-2 \qquad -2$$

$$y = -3x + 10$$

$$y = mx + b$$

$$-2 = -3(4) + b$$

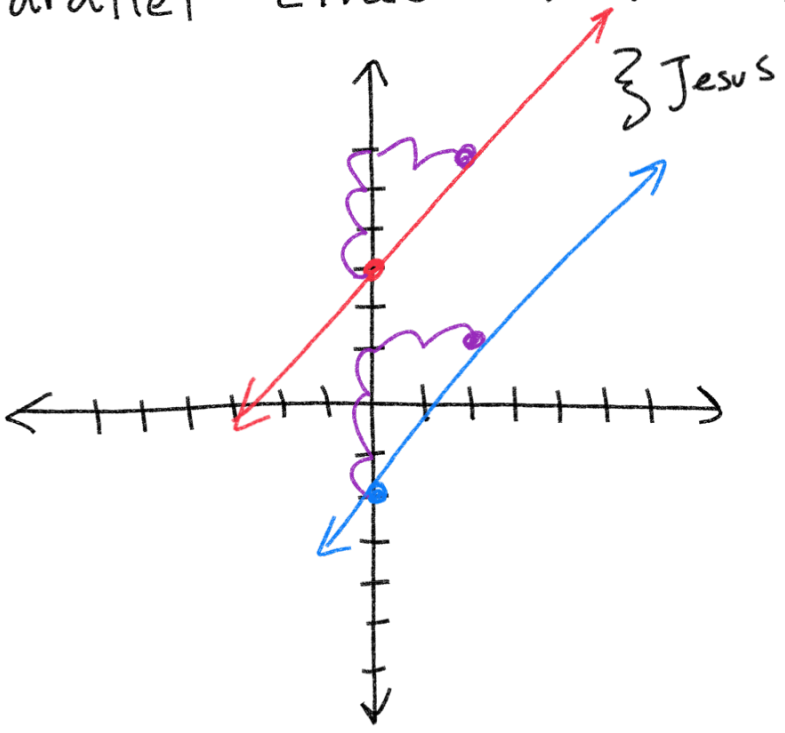
$$-2 = -12 + b$$

$$+12 \quad +12$$

$$10 = b$$

$$y = -3x + 10$$

Parallel Lines → Have the same slope



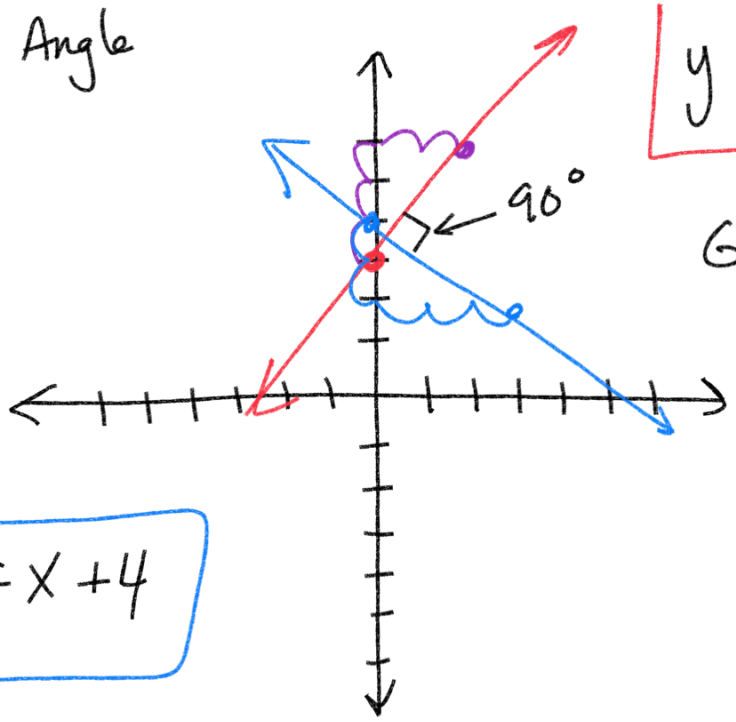
$$y = \frac{3}{2}x + 3$$

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

Perpendicular Lines → opposite inverse slope

Right Angle

90°



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

Given slope: $\frac{3}{2}$

opposite inverse

$\frac{3}{2} \rightarrow \frac{-3}{2} \rightarrow -\frac{2}{3}$

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

Needed slope: $-2/3$

Find the equation for a line parallel to $y = \frac{4}{3}x + 2$ that contains $(6, 3)$

Given slope: $\frac{4}{3}$

Needed slope: $\frac{4}{3}$

$m = 4/3$

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

$y - 3 = \frac{4}{3}(x - 6)$

$y = mx + b$

$3 = \left(\frac{4}{3}\right)6 + b$

$3 = 8 + b$

$-8 \quad -8$

$-5 = b$

$y = \frac{4}{3}x - 5$

$y - 3 = \frac{4}{3}x - 8$

$+3 \qquad +3$

$y = \frac{4}{3}x - 5$

Find the equation for a line perpendicular to $6x - 3y = 18$ through $(8, 2)$.

Given slope: 2

$6x - 3y = 18$

$-6x \quad -6x$

Needed slope: $-\frac{1}{2}$

$-3y = -6x + 18$

$\frac{-3y}{-3} = \frac{-6x}{-3} + \frac{18}{-3}$

$y = 2x - 6$

slope

$y = mx + b$

2 → opposite -2 → inverse $-\frac{1}{2} = m$

$y = mx + b$

$2 = (-\frac{1}{2})(8) + b$

$2 = -4 + b$

$+4 \quad +4$

$6 = b$

$y = -\frac{1}{2}x + 6$

Find the equation for a line parallel to $6x - 2y = 18$ including $(1, 8)$

Given slope: 3

Needed slope: $3 = m$

$y = mx + b$

$8 = (3)(1) + b$

$8 = 3 + b$

$-3 \quad -3$

$b = 5$

$6x - 2y = 18$

$-6x \quad -6x$

$\frac{-2y}{-2} = \frac{-6x}{-2} + \frac{18}{-2}$

$y = 3x - 9$

$y = 3x + 5$