W-A1 Algebra 1 5/4

slope

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

(3, 2) (-5, 12)

$x_1\ y_1$ $x_2\ y_2$

$$m = \frac{12 - 2}{-5 - 3} = \frac{10 \div 2}{-8 \div 2} = -\frac{5}{4}$$

$-\frac{5}{4}$ down 5 / 4 right

$x_1\ y_1$ $x_2\ y_2$

(-4, 3) (2, -9)

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{-9 - 3}{2 - (-4)} = \frac{-12}{6} = -2$$

$2 + 4$

$$\frac{3 - (-9)}{-4 - 2} = \frac{12}{-6} = -2$$

slope-intercept form

$y = mx + b$ (m: slope, b: y-intercept)

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

y-int: 6

$y = mx + b$

$y = \frac{3}{2}x + 6$

slope $= -\frac{8}{9}$

$y = mx + b$

y-int $= -3$

$\boxed{y = -\frac{8}{9}x - 3}$

$(-1, 7)$ $(3, 5)$ → Linear Equation in slope-intercept form

1.) Find Slope

$\boxed{m} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5-7}{3-(-1)} = \frac{-2}{4} = \boxed{\frac{-1}{2}}$

$3+1$

2a) solve for b

$y = mx + b$ $(3, 5)$

$x = 3$ $y = 5$

$5 = \left(-\frac{1}{2}\right)(3) + b$

$5 = -\frac{3}{2} + b$

$+\frac{3}{2}$ $+\frac{3}{2}$

$\frac{10}{2} + \frac{3}{12} = \boxed{b = \frac{13}{2} \text{ or } 6\frac{1}{2}}$

$5 = b - \frac{3}{2}$

$+\frac{3}{2}$

$y = mx + b$

$\boxed{y = -\frac{1}{2}x + \frac{13}{2}}$

2b) Use point-slope form $y - y_1 = m(x - x_1)$

$y - y_1 = m(x - x_1)$ $(3, 5)$

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

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

$+5$ $+5$

$\boxed{y = -\frac{1}{2}x + \frac{13}{2}}$

$(-2, 9)$ $(6, 5)$ Find the linear equation in slope-intercept form.

1.) Slope $= \frac{y_2 - y_1}{x_2 - x_1} = \frac{9-5}{-2-6} = \frac{4}{-8} = \boxed{-\frac{1}{2} = m}$

2.)a Solve for b $(6, 5)$

$y = mx + b$

$5 = (-\frac{1}{2})(6) + b$

$5 = -3 + b$

$+3 \quad +3$

$\boxed{b = 8}$

$y = mx + b$

$\boxed{y = -\frac{1}{2}x + 8}$

$5 = b - 3$

$+3 \quad +3$

2b) Point-Slope $(6, 5)$

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

$y - 5 = -\frac{1}{2}(x - 6)$

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

$+5 \quad +5$

$\boxed{y = -\frac{1}{2}x + 8}$

Standard Form

$$Ax + By = C$$

$2x + 3y = 6$

1.) Stubbornly refuse to use standard form.

Convert to slope-intercept

$y = mx + b$

$2x + 3y = 6$

$-2x \quad -2x$

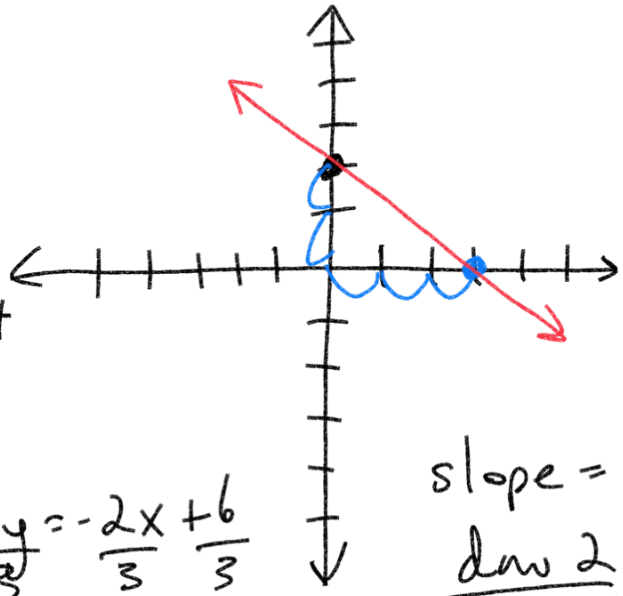
$\frac{3y}{3} = \frac{-2x}{3} + \frac{6}{3}$

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

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

down 2

3 right



Graph using intercepts

$2x + 3y = 6$

$x = 0$

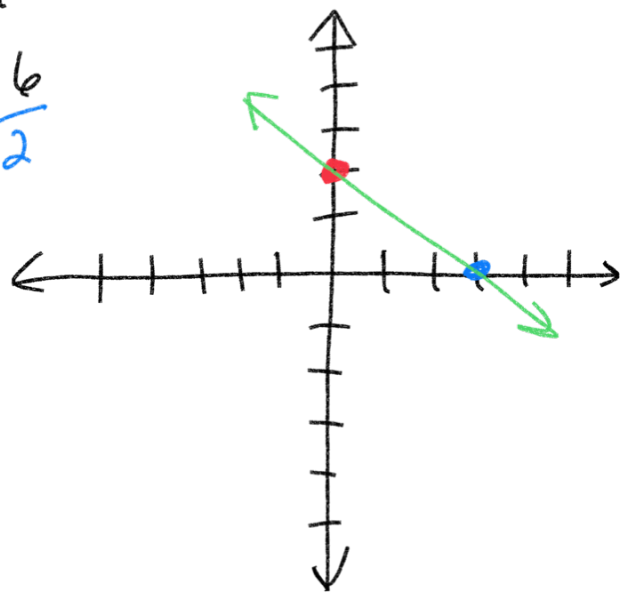
$\frac{3y}{3} = \frac{6}{3}$

$y = 2$

$(0, 2)$

$y = 0$

$\frac{2x}{2} = \frac{6}{2}$

$x = 3$

$(3, 0)$