

## Slope-Intercept Form of a Line (5.4-5.5)

$$y = mx + b$$

$m$  is the slope and  $b$  is the  $y$ -coordinate of the  $y$ -intercept

## Standard Form of a Line

$$Ax + By = C$$

$A$ ,  $B$ , and  $C$  are Integers

Write each equation in Standard Form.

Ex 1:  $y = -3x + 5$

$$\begin{array}{cc} +3x & +3x \\ \hline \end{array}$$

$$\boxed{3x + y = 5}$$

Ex 2:  $y = \frac{1}{2}x - 3$

$$\begin{array}{cc} +(-\frac{1}{2}x) & +(-\frac{1}{2}x) \\ \hline \end{array}$$

$$(-2)\left(-\frac{1}{2}x + y\right) = (-3)(-2)$$

$$\boxed{x + (-2y) = 6}$$

Write each equation in Standard Form.

Ex 3:

$$15 \left( \frac{2}{3}x - \frac{1}{5}y \right) = (1)15$$

$$10x + (-3y) = 15$$

Ex 4: The line passes through (10, 6) and (6, 1).

Slope Form 1st

$$m = \frac{\Delta y}{\Delta x} = \frac{6-1}{10-6} = \frac{5}{4}$$

$$y = mx + b$$

$$6 = \frac{5}{4}(10) + b$$

$$\frac{12}{2} = \frac{25}{2} + b$$

$$b = -\frac{13}{2}$$

$$y = \frac{5}{4}x + \left(-\frac{13}{2}\right)$$

$$(-4) \left( \frac{5}{4}x + y \right) = \left(-\frac{13}{2}\right)(-4)$$

$$5x + (-4y) = 26$$

Graph the two lines on the same coordinate plane.

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

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

y-int (0, 2)

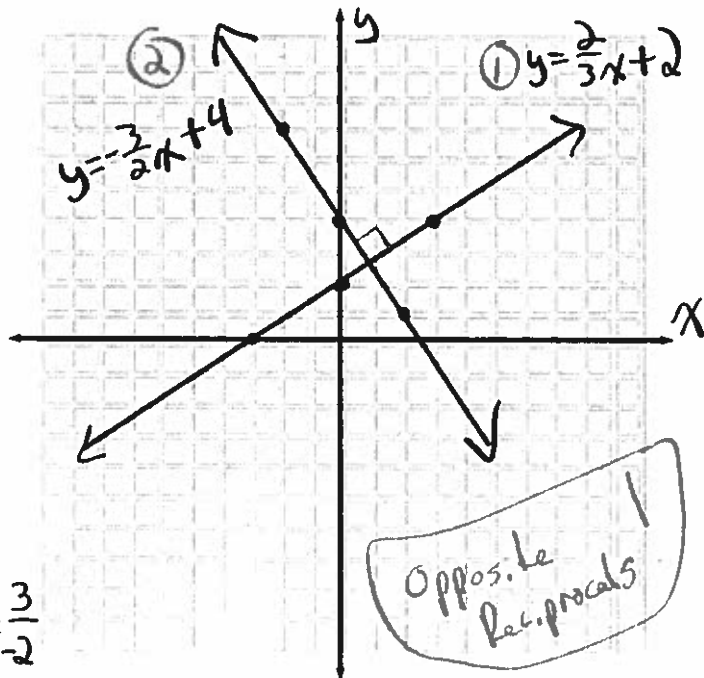
eq 2  $3x + 2y = 8$

$$2y = -3x + 8$$

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

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

y-int (0, 4)



How do you write equations using parallel and perpendicular lines?

Parallel lines have the same slope.

Perpendicular lines have opposite reciprocal slopes.

$$m = \frac{2}{3} \quad \text{and} \quad m = -\frac{3}{2}$$

Ex 1: Write the equation of the line that goes through (18,4) and is parallel to the line  $3y=x-12$ .

$$\textcircled{1} \quad y = \frac{1}{3}x + (-4)$$

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

$$\textcircled{2} \quad y = mx + b \quad (18, 4)$$

$$4 = \frac{1}{3}(18) + b$$

$$4 = 6 + b$$

$$b = -2$$

S-int:

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

$$(-3) \left( -\frac{1}{3}x + y \right) = (-2)(-3)$$

Standard:

$$\boxed{x + (-3y) = 6}$$

Ex 2: Write an equation of a line that goes through (8,-1) and is perpendicular to the line  $4y+2x=12$ .

$$\begin{aligned} \textcircled{1} \quad 4y &= -2x + 12 \\ y &= -\frac{1}{2}x + 3 \\ m &= -\frac{1}{2} \end{aligned}$$

S-int:

$$y = 2x + (-17)$$

$$\begin{aligned} \textcircled{2} \quad m &= 2 \quad (8, -1) \\ y &= mx + b \\ -1 &= 2(8) + b \\ -1 &= 16 + b \\ b &= -17 \end{aligned}$$

Standard:

$$-2x + y = -17$$

### Assignment #25

Part I: p. 314-315 #13-16, 19-24, 39-41

Part II: p. 321-323 #1-5, 8, 12-14, 17-25 odd, 32, 36-37