

Sec. 5.5 The Standard and Point-Slope Forms

Standard Form

$$Ax + By = C$$

A → positive

m → $-\frac{A}{B}$

$$\begin{array}{r} Ax + By = C \\ -Ax \quad -Ax \\ \hline \end{array}$$

$$y = \boxed{m}x + b$$

$$\frac{By}{B} = \frac{-Ax}{B} + \frac{C}{B}$$

$$y = \boxed{-\frac{A}{B}}x + \frac{C}{B}$$

$$\boxed{m = -\frac{A}{B}}$$

Ex: $2y - 5 = 3x$ - write in standard form.

$$\begin{array}{r} -2y \quad -2y \\ \hline \end{array}$$

$$-5 = 3x - 2y$$

$$3x - 2y = -5$$

$$Ax + By = C$$

$$\begin{array}{r} \text{or} \\ 2y - 5 = 3x \\ \quad +5 \quad +5 \\ \hline 2y = 3x + 5 \\ -3x \quad -3x \\ \hline -3x + 2y = 5 \\ \quad -1 \quad -1 \quad -1 \\ \hline 3x - 2y = -5 \end{array}$$

Point - Slope Form

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

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

$$m(x_2 - x_1) = y_2 - y_1$$

$$y_2 - y_1 = m(x_2 - x_1)$$

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

Ex: A line with a slope of -5 contains the point $(2, 3)$.

Write an equation in point-slope form for the line.

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

$$y - 3 = -5(x - 2)$$

Ex: slope: -4 , contains $(4, 2)$

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

Ex: Write an equation in p-s form for a line that contains the points $(3, -6)$ and $(-5, 2)$ and then change the equation to slope-intercept form.

$$m = \frac{2 - (-6)}{-5 - 3} = \frac{8}{-8} = -1$$

$$y - (-6)$$

$$y + 6 = -1(x - 3)$$

$$y + 6 = -x + 3$$

$$\frac{\quad}{-6} \quad \frac{\quad}{-6}$$

$$y = -x - 3$$

p. 256 (18, 20, 24, 29-31, 38)
