Principles of Algebra Name/Date Clee / Today

# WS 8B.2 – More Standard Form and Point-Slope Form

**#1-2 – Convert each equation to standard form.**

**1.** $2y = 3x - 4$

$-3x \quad -3x$

$-3x + 2y = -4$ (·(-1) ·(-1) ·(-1))

$\boxed{3x - 2y = 4}$

**Standard Form**

$Ax + By = C$

① No fractions
② x and y alone on left
③ x first and positive

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

$-\frac{2}{3}y \quad -\frac{2}{3}y$

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

$\boxed{3x - 2y = 18}$

**#3 – Write an equation in point-slope form that meets the given conditions.**

**3.** Slope $\frac{1}{3}$, through $(3, -4)$

$m$ $\quad x_1, y_1$

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

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

**Point-Slope Form**

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

**#4-5 – Write each equation in slope-intercept form AND in standard form.**

**4.** $3y = 9x + 15$

Convert to slope-intercept by solving for y:

$\frac{3y}{3} = \frac{9x}{3} + \frac{15}{3}$

$\boxed{y = 3x + 5}$ (slope-intercept)

Convert to standard form by following the 3 steps listed above:

$y = 3x + 5$

$-3x \quad -3x$

$-3x + y = 5$ (·(-1) ·(-1) ·(-1))

$\boxed{3x - y = -5}$ (standard)

**5.** $7y = -5(x - 35)$

Convert to slope-intercept by solving for y:

$7y = -5(x - 35)$

$\frac{7y}{7} = \frac{-5x}{7} + \frac{175}{7}$

$\boxed{y = -\frac{5}{7}x + 25}$ (slope-intercept)

Convert to standard form by following the 3 steps listed above:

$y \cdot 7 = -\frac{5}{7}x \cdot 7 + 25 \cdot 7$

$7y = -5x + 175$

$+5x \quad +5x$

$\boxed{5x + 7y = 175}$ (standard)

**#6-8 – Write an equation in point-slope form for each situation, then convert to slope-intercept form, then convert to standard form.**

**6.** Through $(5, -2)$ and $(-2, 5)$

① Find slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

$$m = \frac{(5)-(-2)}{(-2)-(5)} = \frac{7}{-7}$$

$$m = -1$$

② Point-slope form:

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

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

OR $\boxed{y - 5 = -1(x + 2)}$

③ Slope-intercept form:

$y = mx + b$ (solve for $y$)

$y + 2 = -1(x - 5)$

$y + 2 = -x + 5$

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

④ Standard form:

$Ax + By = C$

$y = -x + 3$

$\boxed{x + y = 3}$

**7.** Through $(3, 2)$ and $(-3, -2)$

① Find slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

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

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

② Point-slope form:

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

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

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

③ Slope-intercept form:

$y = mx + b$ (solve for $y$)

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

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

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

④ Standard form:

$Ax + By = C$

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

$3y = 2x$ → $-2x + 3y = 0$

$\boxed{2x - 3y = 0}$

**8.** Slope $-4$, through $(-3, 1)$

① Find slope: $m = -4$

② Point-slope form:

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

$\boxed{y - 1 = -4(x + 3)}$

③ Slope-intercept form:

$y = mx + b$ (solve for $y$)

$y - 1 = -4(x + 3)$

$y - 1 = -4x - 12$

$\boxed{y = -4x - 11}$

④ Standard form:

$Ax + By = C$

$y = -4x - 11$

$\boxed{4x + y = -11}$