

Forms of Linear Equations

Slope-Intercept Form

$$y = mx + b$$

$m = \text{slope}$

$b = y - \text{intercept}$

Point-Slope Form

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

Coordinate Point (x_1, y_1)

$m = \text{slope}$

Standard Form

$$Ax + By = C$$

$A, B,$ and C are integers

A is positive

Point-Slope to Slope-Intercept:

Distribute m with values in parentheses

Solve for y by moving the constant to the right

$$y - 5 = \frac{1}{2}(x + 8)$$

$$y - 5 = \frac{1}{2}x + 4$$

$$+ 5 \quad + 5$$

$$y = \frac{1}{2}x + 9$$

Slope-Intercept to Standard:

Move x term to the left

If $A, B,$ or C are fractions, multiply all terms by the LCM of the denominators

If A is negative, multiply all terms by -1

$$y = \frac{1}{2}x + 9$$

$$-\frac{1}{2}x \quad -\frac{1}{2}x$$

$$-\frac{1}{2}x + y = 9$$

$$2(-\frac{1}{2}x + y = 9)$$

$$-x + 2y = 18$$

$$-1(-x + 2y = 18)$$

$$x - 2y = -18$$

Standard to Slope-Intercept:

Move x term to the right

Divide all terms by the coefficient of y

$$x - 2y = -18$$

$$-x \quad -x$$

$$-2y = -x - 18$$

$$\frac{-2y}{-2} = \frac{-1}{-2}x + \frac{-18}{-2}$$

$$y = \frac{1}{2}x + 9$$