

Writing Linear Equations

Important Formulas:

Slope Intercept $y = mx + b$

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

Standard Form $ax + by = c$

Slope $m = \frac{y_2 - y_1}{x_2 - x_1}$

Parallel-SAME SLOPE Perpendicular-Opposite Reciprocal

Given the y intercept and slope

$$b = -3$$

$$m = 2/3$$

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

Given a point and the slope

$$m = -6 \quad (-2, 4)$$

$$x_1 \quad y_1$$

$$y - 4 = -6(x + 2)$$

$$y - 4 = -6x - 12$$

$$y = -6x - 8$$

Given two points

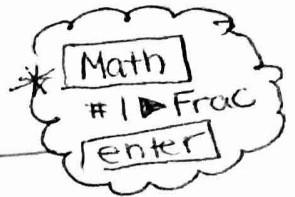
$$(-5, 6) \quad (3, 9)$$

$$x_1 \quad y_1 \quad x_2 \quad y_2$$

$$m = \frac{9 - 6}{3 - (-5)} = \frac{3}{8}$$

$$y - 6 = \frac{3}{8}(x + 5)$$

$$y - 6 = \frac{3}{8}x + \frac{15}{8}$$



$$y = \frac{3}{8}x + \frac{51}{8}$$

Given a Point and Parallel or Perpendicular Line

Parallel to $y = 2/3x + 6$ through $(3, -2)$
 $x_1 \quad y_1$

$$m = 2/3 \quad y + 2 = \frac{2}{3}(x - 3)$$

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

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

$(2, -5)$

Perpendicular $y = 2/3x + 6$ through $(2, 5)$
 $x_1 \quad y_1$

$$y + 5 = -3/2(x - 2) \quad m = -3/2$$

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

$$y = -3/2x - 2$$

Written in Standard Form

Solve for y =

$$3x - y = 8$$

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

$$\frac{-y}{-1} = \frac{-3x + 8}{-1}$$

$$y = 3x - 8$$