

3.4 Linear Equations in Standard Form

Standard Form: $Ax + By = C$
 where A, B, C are numbers

A is NOT negative.

★ We NEVER plug in to this form.

- Form we give the answer in

- Variables on one side in
 alpha order

★ No Fractions

Example: Write the standard form of the equation of the line shown in the accompanying diagram.

1. $m = \frac{3}{4}$
 $b = 4$

$$y = mx + b$$

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

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

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

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

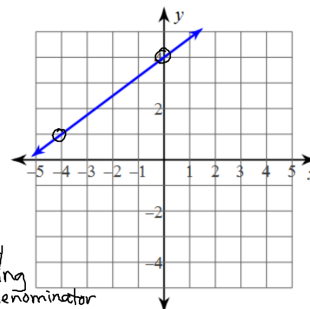
$$\frac{4}{1}(-\frac{3}{4}x + y) = 4(4)$$

$$-3x + 4y = 16$$

$$-1(-3x + 4y) = -1(16)$$

$$\boxed{3x - 4y = -16}$$

★ Multiply
 everything
 by the denominator



Write the standard form of the equation of the line through the given point with the given slope.

2. $(-3, -2); m = \frac{4}{3}$

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

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

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

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

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

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

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

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

$$-\frac{3}{1}(-\frac{4}{3}x) - 3(y) = -3(2)$$

$$\boxed{4x - 3y = -6}$$

Write the standard form of the equation of the line through the given points.

3. $(0, 1)$ and $(-2, 4)$

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

$$m = \frac{4 - 1}{-2 - 0}$$

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

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

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

$$y - 1 = -\frac{3}{2}(x - 0)$$

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

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

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

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

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

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

HOMEWORK

Worksheet HW 3.4 - Linear Equations
 in Standard Form