

5.5 General Form

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5.5 General Form of the Equation for a Linear Function

General form for the Equation of a Line

$$Ax + By + C = 0$$

Is the general form of the equation of a line, where A is a whole number, and B and C are integers.

*A is positive
No Fractions*

Example 1 : Write each equation in general form.

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

Multiply all terms by 3

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

$$3y = -2x + 12$$

$$3y + 2x - 12 = 0$$

$$2x + 3y - 12 = 0$$

*Move all terms left
So X's are positive*

b) $y - 1 = -\frac{3}{5}(x + 2)$

$$y - 1 = -\frac{3}{5}x - \frac{6}{5}$$

$$y(5) - 1(5) = \left(-\frac{3}{5}x\right)(5) - \frac{6}{5}(5)$$

$$5y - 5 = -3x - 6$$

$$5y - 5 + 3x + 6 = 0$$

$$3x + 5y + 1 = 0$$

Example 2 : Determine the slope of the equation : $3x - 2y - 16 = 0$

Rewrite the equation as $y = mx + b$

$$3x - 2y - 16 = 0$$

$$\frac{-2y}{-2} = \frac{-3x + 16}{-2}$$

$$y = \frac{3}{2}x - 8$$

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

Example 3 : Determine the x and y intercepts of the line $3x + 2y - 18 = 0$. Graph the line.

x-intercept :

Make $y=0$

$$3x + 2(0) - 18 = 0$$

$$3x + 0 - 18 = 0$$

$$\frac{3x}{3} = \frac{18}{3}$$

$$x = 6$$

$$(6, 0)$$

y-intercept :

Make $x=0$

$$3(0) + 2y - 18 = 0$$

$$0 + 2y - 18 = 0$$

$$\frac{2y}{2} = \frac{18}{2}$$

$$y = 9$$

$$(0, 9)$$

Slope:

$$\textcircled{1} m = \frac{\text{rise}}{\text{run}} = \frac{-9}{6} \div 3 = \frac{-3}{2}$$

$\textcircled{2}$

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

$$\begin{matrix} (6, 0) & (0, 9) \\ x_1, y_1 & x_2, y_2 \end{matrix}$$

$$m = \frac{9 - 0}{0 - 6}$$

$$m = \frac{9}{-6} = \frac{-3}{2}$$

$\textcircled{3}$

$$3x + 2y - 18 = 0$$

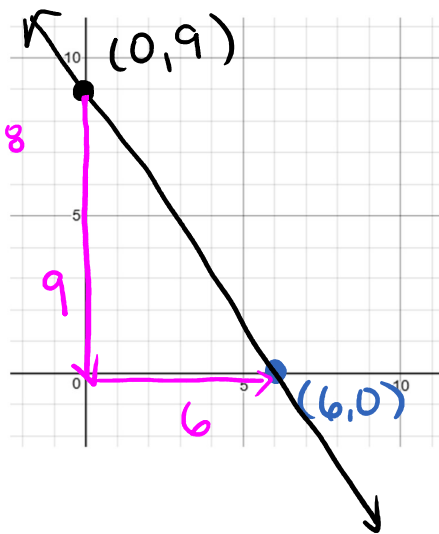
General form

Rewrite as slope-intercept form

$$3x + 2y - 18 = 0$$

$$\frac{2y}{2} = \frac{-3x}{2} + \frac{18}{2}$$

$$y = \frac{-3}{2}x + 9$$



Practice : p.384 #5-7, 12bc, 13bc, 18

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F & PC 10