

Algebra 1 4.3

Write equations of lines in point-slope form

Write linear equations in different forms

slope-intercept form

point-slope form

standard form

speed dating

$$Ax + By = C$$

$$\underline{3}x - \underline{5}y = \underline{18}$$

$$A = 3$$

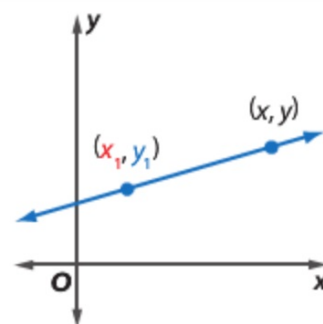
$$B = -5$$

$$C = 18$$

KeyConcept Point-Slope Form

Words The linear equation $y - y_1 = m(x - x_1)$ is written in point-slope form, where (x_1, y_1) is a given point on a nonvertical line and m is the slope of the line.

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



$$m = -\frac{2}{7}$$

Write the equation of the line passing through (1,5) and (8,3).

$$y - 3 = -\frac{2}{7}(x - 8)$$

a) point-slope form

$$y = -\frac{2}{7}x + B \quad 5 = -\frac{2}{7} \cdot 1 + B$$

b) slope-intercept form

$$y = -\frac{2}{7}x + 5\frac{2}{7}$$

c) standard form

$$y = -\frac{2}{7}x + 5\frac{2}{7}$$

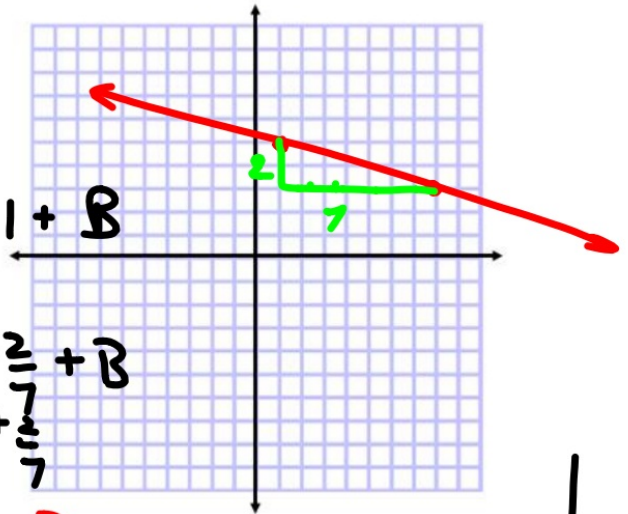
$$Ax + By = C$$

$$\begin{array}{r} +\frac{2}{7}x \quad +\frac{2}{7}x \\ \hline 7 \cdot \frac{2}{7}x + 7y = 7 \cdot 5\frac{2}{7} \end{array}$$

$$\frac{14}{7}x$$

$$2x + 7y = 37$$

$$A = 2 \quad B = 7 \quad C = 37$$



Standard form

- *In order*
- *Only integers (no fractions, no decimals)*
- *No GCF*
- (• *First term positive*)

S.F.

$$y = -2x + 7$$

$$2x + y = 7$$

$$A = -2 \quad B = 1$$

$$C = 7$$

$$\begin{array}{r} 3y = -\frac{1}{2}x + \frac{1}{2} \\ +\frac{1}{2}x \end{array}$$

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

$$x + 6y = 1$$

$$A = 1 \quad B = 6 \quad C = 1$$

$$y = \frac{1}{3}x + 5$$

$$\begin{array}{r} -\frac{1}{3}x \quad -\frac{1}{3}x \\ \hline \end{array}$$

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

$$\begin{array}{r} -1x + 3y = 15 \\ \hline -1 \quad -1 \quad -1 \end{array}$$

$$x - 3y = -15$$

$$2y = 6x + 18$$

$$\begin{array}{r} -6x \quad -6x \\ \hline \end{array}$$

$$\begin{array}{r} -6x + 2y = 18 \\ \hline -1 \quad -1 \quad -1 \end{array}$$

$$\boxed{6x - 2y = -18}$$

$$\begin{array}{r} 2 \quad 2 \quad 2 \end{array}$$

$$\rightarrow 3x - y = -9$$

$$Ax + By = C$$

$$4x = 2y + 6$$

$$\begin{array}{r} -2y \quad -2y \\ \hline \end{array}$$

$$\frac{4x}{2} - \frac{2y}{2} = \frac{6}{2}$$

$$2x + y = 3 \quad A=2 \quad B=-1 \quad C=3$$

$$Ax + By = C$$

$$y - 3 = 2(x + 5)$$

$$y - 3 = 2x + 10$$

$$-2x + y - 3 = 10$$

$$-2x + y = 13$$

$$4x - 2y = -26$$

$$2x - y = -13$$

$$\begin{array}{r} -2x + y = 13 \\ \hline -1 \quad -1 \quad -1 \end{array}$$

$$2x - y = -13$$

