Algebra 1 4.3

Write equations of lines in point-slope form

Write linear equations in different forms

slope-intercept form $y = mx + B$

point-slope form $y - y_1 = m(x - x_1)$

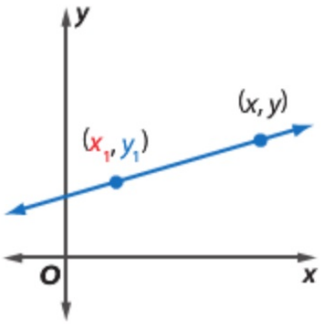
standard form (Ch.3) $Ax + By = C$

speed dating

## 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.

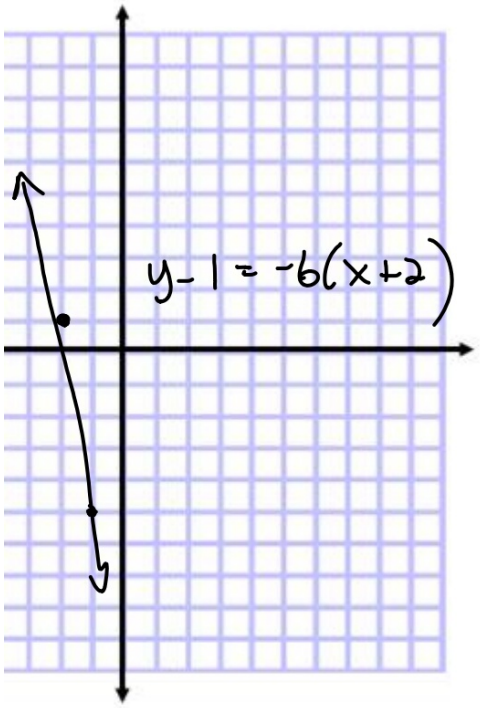
**Symbols** $y - y_1 = m(x - x_1)$



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

**GuidedPractice**

**1.** Write an equation in point-slope form for the line that passes through $(-2, 1)$ with a slope of $-6$. Then graph the equation.




$y - 1 = -6(x+2)$

$y - 1 = -6(x+2)$

$y = -6x - 12 + 1$

$y = -11$

→ S.i. $y = mx + b$

(4, -6)

**GuidedPractice**

$y = mx + B$

**3.** Write $y + 6 = -3(x - 4)$ in slope-intercept form.

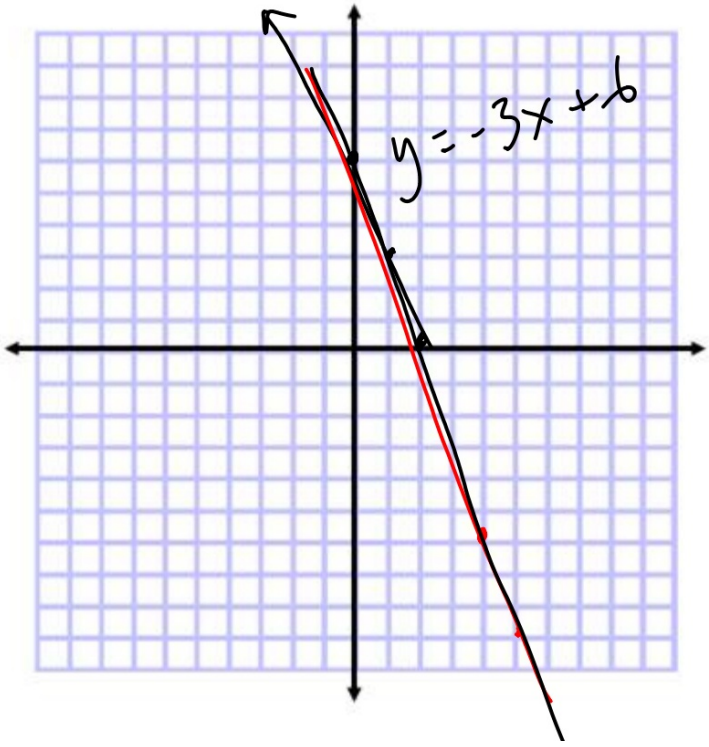
$y - -6$

$y + +6$

$y + 6 = -3x + 12$

$-6 \qquad -6$

$y = -3x + 6$



**Example 3** Slope-Intercept Form

**Write $y + 3 = \frac{3}{2}(x + 1)$ in slope-intercept form.**

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

$y + 3 = \frac{3}{2}x + 1.5$

$-3 \qquad -3$

$\rightarrow y = \frac{3}{2}x - 1.5$

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

$Ax + By = C$

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

$-\frac{3}{2}x \qquad -\frac{3}{2}x$

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

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

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

$3x - 2y = 3$

## Example 4 Point-Slope Form and Standard Form

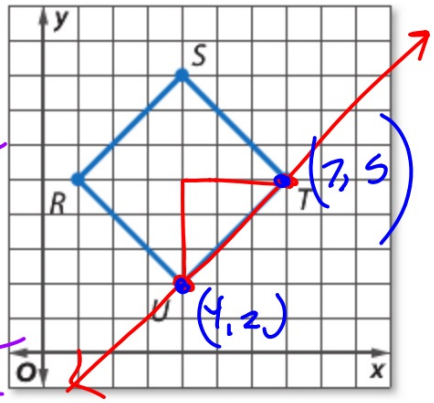
**GEOMETRY** The figure shows square $RSTU$.

**a.** Write an equation in point-slope form for the line containing side $\overline{TU}$.

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

$y - 2 = 1(x - 4)$ → $y - 2 = x - 4$, $+2$ $+2$, $y = x - 2$

$y - 5 = 1(x - 7)$ → $y - 5 = x - 7$, $+5$ $+5$, $y = x - 2$

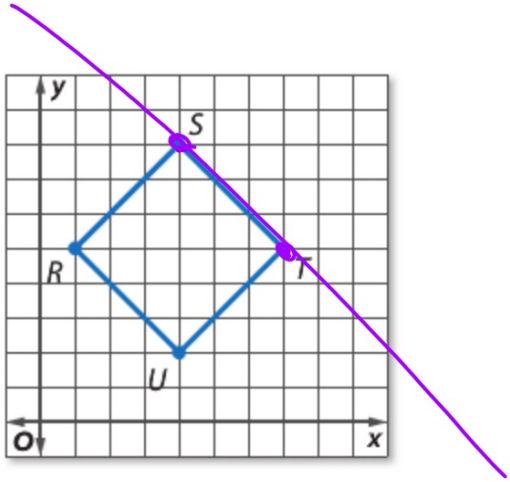



**b.** Write an equation in standard form for the same line.

*SF:*
*In order*
*Integers*
*GCF*

## GuidedPractice

**4A.** Write an equation in point-slope form of the line containing side $\overline{ST}$.




**4B.** Write an equation in standard form of the line containing $\overline{ST}$.

St. Form

$Ax + By = C$

1. in order
2. integers
3. pos A, no GCF

$2x + 5y = -3$

$A = 2 \quad B = 5 \quad C = -3$

$y = 2x - 5$

$-2x \quad -2x$

$-2x + y = -5$

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

$2x - y = 5$

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

$+\frac{1}{3}y \quad +\frac{1}{3}x$

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

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

$x + 3y = 6$