Algebra 2 2.2

Identify linear relations and functions

Write linear equations in standard form

linear

nonlinear

linear equation

linear function

y-intercept

x-intercept

standard form

Alg 1 Ch. 3 & 4

Linear equations	Nonlinear equations
$4x - 5y = 16$	$2x + 6y^2 = -25$
$x = 10$	$y = \sqrt{x} + 2$
$y = -\frac{2}{3}x - 1$	$x + xy = -\frac{5}{8}$
$y = \frac{1}{2}x$	$y = \frac{1}{x}$

How can we tell?

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

$3y = -2x - 3$

$+2x \quad +2x$

$2x + 3y = -3$

$A = 2$, $B = 3$, $C = -3$

$Ax + By = C$

$\frac{-5x}{-1} + \frac{2y}{-1} = \frac{-6}{-1}$

$5x - 2y = 6$

$x + 2y = -3$ $\qquad \frac{3x}{3} + \frac{6y}{3} = -\frac{9}{3}$

2 Standard Form Any linear equation can be written in **standard form**, $Ax + By = C$, where A, B, and C are integers with a greatest common factor of 1.

KeyConcept Standard Form of a Linear Equation

Words	The standard form of a linear equation is $Ax + By = C$, where A, B, and C are integers with a greatest common factor of 1, $A \geq 0$, and A and B are not both zero.
Example	$3x + 5y = 12$; $A = 3$, $B = 5$, and $C = 12$

in order
integers
GCF/A is positive
(we want there to only be one version)

Example 3 Standard Form

integers in order (GCF)

Write $-\frac{3}{10}x = 8y - 15$ in standard form. Identify A, B, and C.

$10 \cdot -\frac{3}{10}x = 8y \cdot 10 - 15 \cdot 10$

$-3x = 80y - 150$

$-80y \quad -80y$

$3x + 80y = 0$

$\frac{-3x}{-1} - \frac{80y}{-1} = \frac{-150}{-1}$

GuidedPractice

Write each equation in standard form. Identify A, B, and C.

3A. $2y = 4x + 5$

3B. $3x - 6y - 9 = 0$

Example 4 Use Intercepts to Graph a Line

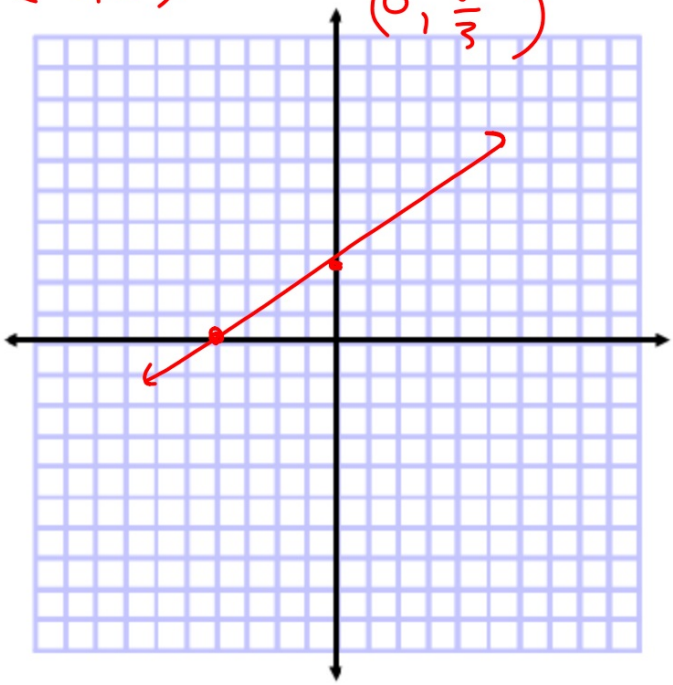
(?, 0)

Find the x-intercept and the y-intercept of the graph of $2x - 3y + 8 = 0$. Then graph the equation.

(0, ?)

(−4, 0)

(0, $\frac{8}{3}$)



TOV or x-int & y-int

$-3y + 8 = 0$

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

$y = \frac{8}{3}$

GuidedPractice

4. Find the x-intercept and the y-intercept of the graph of $2x + 5y - 10 = 0$. Then graph the equation.