5.4 Write Linear Equations in Standard Form

TEKS A.1.C, A.1.D, A.1.E, A.7.A

Before You wrote equations in point-slope form.

Now You will write equations in standard form.

Why? So you can find possible combinations of objects, as in Ex. 41.

Key Vocabulary
- **standard form,** *p. 215*

Recall that the linear equation $Ax + By = C$ is in standard form, where A, B, and C are real numbers and A and B are not both zero. All linear equations can be written in standard form.

EXAMPLE 1 Write equivalent equations in standard form

Write two equations in standard form that are equivalent to $2x - 6y = 4$.

Solution

To write one equivalent equation, multiply each side by 2.

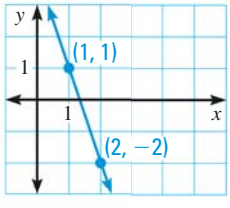
$$4x - 12y = 8$$

To write another equivalent equation, multiply each side by 0.5.

$$x - 3y = 2$$

EXAMPLE 2 Write an equation from a graph

Write an equation in standard form of the line shown.



Solution

STEP 1 **Calculate** the slope.

$$m = \frac{1 - (-2)}{1 - 2} = \frac{3}{-1} = -3$$

STEP 2 **Write** an equation in point-slope form. Use (1, 1).

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

$y - 1 = -3(x - 1)$ Substitute 1 for y_1, -3 for m, and 1 for x_1.

STEP 3 **Rewrite** the equation in standard form.

$3x + y = 4$ Simplify. Collect variable terms on one side, constants on the other.

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GUIDED PRACTICE for Examples 1 and 2

1. Write two equations in standard form that are equivalent to $x - y = 3$.
2. Write an equation in standard form of the line through $(3, -1)$ and $(2, -3)$.