4.2 Graph Linear Equations

TEKS A.1.D, A.2.B, A.5.B, A.5.C

Before You plotted points in a coordinate plane.

Now You will graph linear equations in a coordinate plane.

Why? So you can find how meteorologists collect data, as in Ex. 40.

Key Vocabulary
- **standard form of a linear equation**
- **linear function**

An example of an equation in two variables is $2x + 5y = 8$. A **solution of an equation in two variables**, x and y, is an ordered pair (x, y) that produces a true statement when the values of x and y are substituted into the equation.

EXAMPLE 1 TAKS PRACTICE: Multiple Choice

Which ordered pair is a solution of $4x - y = 6$?

Ⓐ $(-2, 1)$ Ⓑ $(1, -2)$ Ⓒ $(2, -2)$ Ⓓ $(-1, -2)$

Solution

Check whether each ordered pair is a solution of the equation.

Test $(-2, 1)$: $4x - y = 6$ Write original equation.

$4(-2) - 1 \stackrel{?}{=} 6$ Substitute -2 for x and 4 for y.

$-9 = 6$ ✗ Simplify.

Test $(1, -2)$: $4x - y = 6$ Write original equation.

$4(1) - (-2) \stackrel{?}{=} 6$ Substitute 1 for x and -2 for y.

$6 = 6$ ✓ Simplify.

So, $(-2, 1)$ is *not* a solution, but $(1, -2)$ is a solution of $4x - y = 6$.

▶ The correct answer is B. Ⓐ Ⓑ Ⓒ Ⓓ

GUIDED PRACTICE for Example 1

1. Tell whether $\left(4, -\frac{1}{2}\right)$ is a solution of $x + 2y = 5$.

GRAPHS The **graph of an equation in two variables** is the set of points in a coordinate plane that represent all solutions of the equation. If the variables in an equation represent real numbers, one way to graph the equation is to make a table of values, plot enough points to recognize a pattern, and then connect the points. When making a table of values, choose convenient values of x that include negative values, zero, and positive values.