5.2 Use Linear Equations in Slope-Intercept Form

TEKS A.1.C, A.4.C, A.6.D, A.7.A

Before You wrote an equation of a line using its slope and *y*-intercept.

Now You will write an equation of a line using points on the line.

Why So you can write a model for total cost, as in Example 5.

Key Vocabulary
- **y-intercept,** *p. 225*
- **slope,** *p. 235*
- **slope-intercept form,** *p. 244*

KEY CONCEPT *For Your Notebook*

Writing an Equation of a Line in Slope-Intercept Form

STEP 1 **Identify** the slope m. You can use the slope formula to calculate the slope if you know two points on the line.

STEP 2 **Find** the y-intercept. You can substitute the slope and the coordinates of a point (x, y) on the line in $y = mx + b$. Then solve for b.

STEP 3 **Write** an equation using $y = mx + b$.

EXAMPLE 1 Write an equation given the slope and a point

Write an equation of the line that passes through the point (−1, 3) and has a slope of −4.

Solution

STEP 1 **Identify** the slope. The slope is -4.

STEP 2 **Find** the y-intercept. Substitute the slope and the coordinates of the given point in $y = mx + b$. Solve for b.

$y = mx + b$ — Write slope-intercept form.

$3 = -4(-1) + b$ — Substitute -4 for m, -1 for x, and 3 for y.

$-1 = b$ — Solve for b.

AVOID ERRORS
When you substitute, be careful not to mix up the x- and y-values.

STEP 3 **Write** an equation of the line.

$y = mx + b$ — Write slope-intercept form.

$y = -4x - 1$ — Substitute -4 for m and -1 for b.

GUIDED PRACTICE for Example 1

1. Write an equation of the line that passes through the point (6, 3) and has a slope of 2.