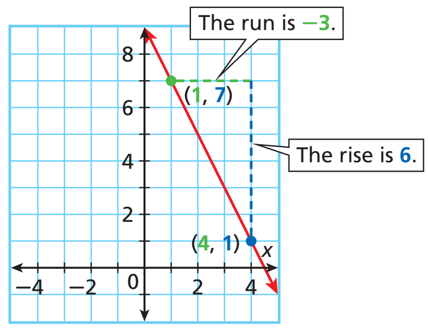
Section Overview

Professional Development

Determining the Slope of a Line — *Lesson 3-5*

Why? Real-world situations that involve a rate of change, such the steepness of a road over a given distance, can be expressed as the ratio of rise over run.

$$\textbf{slope} = \frac{\text{rise}}{\text{run}} = \frac{6}{-3} = -2$$



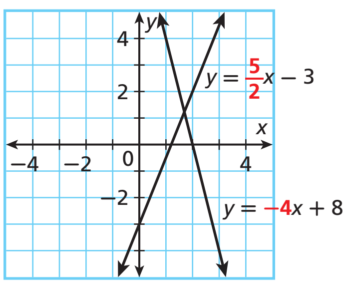
You can also use the slope formula to determine the slope of a line.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

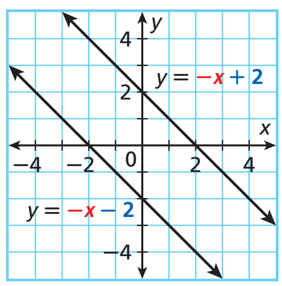
$$m = \frac{7 - 1}{1 - 4} = -2$$

Classifying Lines as Parallel, Intersecting, or Coinciding — *Lessons 3-5, 3-6*

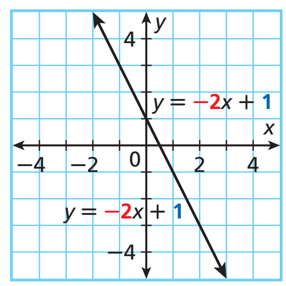
Why? Two real-world situations with the same rate of change, but different initial values, can be modeled by parallel lines.



Intersecting lines have **different slopes.**



Parallel lines have the **same slope** but **different *y*-intercepts.**



Coinciding lines have the **same slope** and **same *y*-intercepts.**

Writing Equations of Lines — *Lesson 3-6*

Why? A linear relationship between two variables can be represented by an equation in point-slope form or slope-intercept form. The equation can then be used to analyze the relationship.

A line has a slope of 2 and a *y*-intercept of −5, and contains the point (3, 1).

Point-Slope Form of the Equation

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

$y - 1 = 2(x - 3)$

Slope-Intercept Form of the Equation

$y = mx + b$

$y = 2x - 5$