5-1 Reteaching

Rate of Change and Slope

The rate of the vertical change to the horizontal change between two points on a line is called the slope of the line.

$$\textbf{slope} = \frac{\text{vertical change}}{\text{horizontal change}} = \frac{\text{rise}}{\text{run}}$$
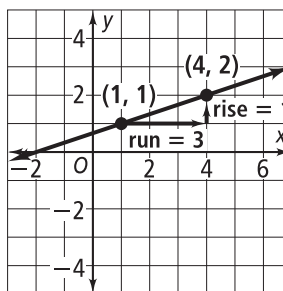
There are two special cases for slopes.

- A horizontal line has a slope of 0.
- A vertical line has an undefined slope.

Problem

What is the slope of the line?

$\text{slope} = \dfrac{\text{vertical change}}{\text{horizontal change}} = \dfrac{\text{rise}}{\text{run}}$

$\quad = \dfrac{1}{3}$

The slope of the line is $\frac{1}{3}$.
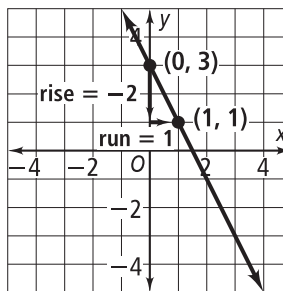

In general, a line that slants upward from left to right has a positive slope.

Problem

What is the slope of the line?

$\text{slope} = \dfrac{\text{vertical change}}{\text{horizontal change}} = \dfrac{\text{rise}}{\text{run}}$

$\quad = \dfrac{-2}{1}$

$\quad = -2$

The slope of the line is -2.

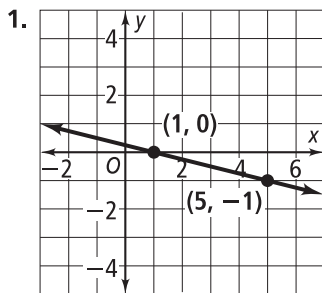In general, a line that slants downward from left to right has a negative slope.
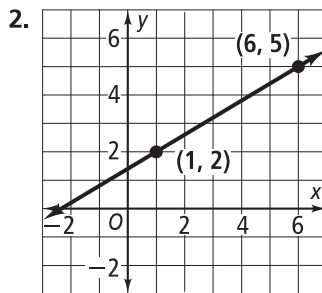
5-1 | Reteaching (continued)

Rate of Change and Slope

Exercises

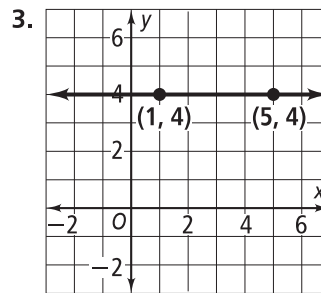**Find the slope of each line.**

1.

$-\dfrac{1}{4}$

2.

$\dfrac{3}{5}$

3.

0

Suppose one point on a line has the coordinates (x_1, y_1) and another point on the same line has the coordinates (x_2, y_2). You can use the following formula to find the slope of the line.

$$\textbf{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}, \text{ where } x_2 - x_1 \neq 0$$

Problem

What is the slope of the line through $R(2, 5)$ and $S(-1, 7)$?

$\text{slope} = \dfrac{y_2 - y_1}{x_2 - x_1}$

$\qquad = \dfrac{7 - 5}{-1 - 2}$ 　　Let $y_2 = 7$ and $y_1 = 5$.
　　　　　　　　　　　Let $x_2 = -1$ and $x_1 = 2$.

$\qquad = \dfrac{2}{-3} = -\dfrac{2}{3}$

Exercises

Find the slope of the line that passes through each pair of points.

4. $(0, 0), (4, 5)$ $\dfrac{5}{4}$

5. $(2, 4), (7, 8)$ $\dfrac{4}{5}$

6. $(-2, 0), (-3, 2)$ -2

7. $(-2, -3), (1, 1)$ $\dfrac{4}{3}$

8. $(1, 4), (2, -3)$ -7

9. $(3, 2), (-5, 3)$ $-\dfrac{1}{8}$