

11-4**Study Guide and Intervention****The Slope Formula**

The slope m of a line passing through points (x_1, y_1) and (x_2, y_2) is the ratio of the difference in the y coordinates to the corresponding difference in the x coordinates. As an equation, the slope is given by

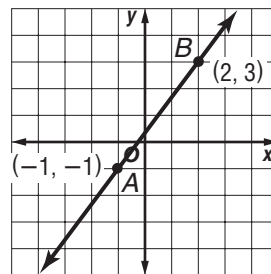
$$m = \frac{y_2 - y_1}{x_2 - x_1}, \text{ where } x_1 \neq x_2.$$

EXAMPLE 1 Find the slope of the line that passes through $A(-1, -1)$ and $B(2, 3)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \text{Definition of slope}$$

$$m = \frac{3 - (-1)}{2 - (-1)} \quad (x_1, y_1) = (-1, -1), \\ (x_2, y_2) = (2, 3)$$

$$m = \frac{4}{3} \quad \text{Simplify.}$$



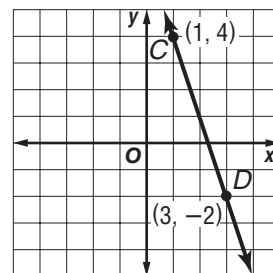
Check When going from left to right, the graph of the line slants upward. This is consistent with a positive slope.

EXAMPLE 2 Find the slope of the line that passes through $C(1, 4)$ and $D(3, -2)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \text{Definition of slope}$$

$$m = \frac{-2 - 4}{3 - 1} \quad (x_1, y_1) = (1, 4), \\ (x_2, y_2) = (3, -2)$$

$$m = \frac{-6}{2} \text{ or } -3 \quad \text{Simplify.}$$



Check When going from left to right, the graph of the line slants downward. This is consistent with a negative slope.

The slope of any horizontal line is zero. The slope of any vertical line is undefined.

EXERCISES

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

1. $A(0, 1), B(3, 4)$

2. $C(1, -2), D(3, 2)$

3. $E(4, -4), F(2, 2)$

4. $G(3, 1), H(6, 3)$

5. $I(4, 3), J(2, 4)$

6. $K(-4, 4), L(5, 4)$