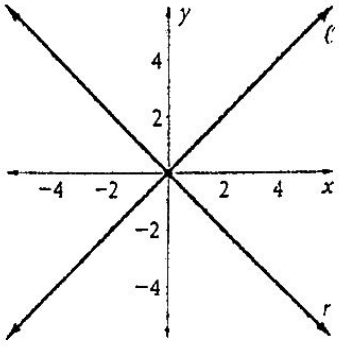
Slope

FOR USE WITH LESSON 3-6

The *slope* of a line is the ratio of the vertical change (rise) to the horizontal change (run) between any two points (x_1, y_1) and (x_2, y_2) of the line.

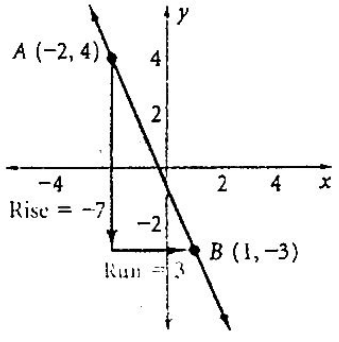
$$\text{slope} = \frac{\text{vertical change}}{\text{horizontal change}} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

The slope of a line indicates the steepness of the line and whether it rises or falls from left to right. Line ℓ has slope 1, rising from left to right. Line r has slope -1, falling from left to right. Both form 45° angles with the x-axis.



1 EXAMPLE

Find the slope of $\overleftrightarrow{AB}$, which passes through $A(-2, 4)$ and $B(1, -3)$.



Method 1 Use the formula.

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3 - 4}{1 - (-2)} = \frac{-7}{3}, \text{ or } -\frac{7}{3}$$

Method 2 Use the graph.

$$\text{slope} = \frac{\text{vertical change (rise)}}{\text{horizontal change (run)}} = \frac{-7}{3}, \text{ or } -\frac{7}{3}$$

Find the slope of the line that contains each pair of points.

1. $A(-2, 2), B(4, -2)$

2. $P(3, 0), X(0, -5)$

3. $R(-3, -4), S(5, -4)$

4. $K(-3, 3), T(-3, 1)$

5. $C(0, 1), D(3, 3)$

6. $E(-1, 4), F(3, -2)$

7. $G(-8, -9), H(-3, -5)$

8. $L(7, -10), M(1, -4)$