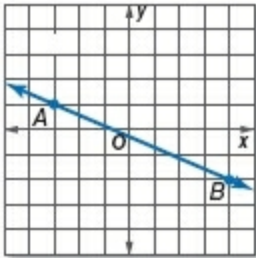


2-8 Slope and Equations of Lines

Find the slope of each line.



13.

SOLUTION:

The coordinates of the point A is $(-3, 1)$ and that of B is $(4, -2)$. Substitute the values in the slope formula.

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{-2 - 1}{4 - (-3)} \\ &= \frac{-3}{7} \\ &= -\frac{3}{7} \end{aligned}$$

Therefore, the slope of the line is $-\frac{3}{7}$.

Determine the slope of the line that contains the given points.

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

SOLUTION:

Substitute the coordinates of the points in the slope formula.

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{1 - 1}{-2 - 3} \\ &= \frac{0}{-5} \\ &= 0 \end{aligned}$$

Therefore, the slope of the line is 0.

2-8 Slope and Equations of Lines

18. $G(-4, 3), H(-4, 7)$

SOLUTION:

Substitute the coordinates of the points in the slope formula.

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{7 - 3}{-4 - (-4)} \\ &= \frac{4}{0} \end{aligned}$$

Division of any number by zero is undefined.

Therefore, the slope of the line is undefined.

22. $R(2, -6), S(-6, 5)$

SOLUTION:

Substitute the coordinates of the points in the slope formula.

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{5 - (-6)}{-6 - 2} \\ &= \frac{11}{-8} \\ &= -\frac{11}{8} \end{aligned}$$

Therefore, the slope of the line is $-\frac{11}{8}$.

2-8 Slope and Equations of Lines

Determine whether \overline{AB} and \overline{CD} are *parallel*, *perpendicular*, or *neither*. Graph each line to verify your answer.

32. $A(4, 2)$, $B(-3, 1)$, $C(6, 0)$, $D(-10, 8)$

SOLUTION:

Substitute the coordinates of the points in slope formula to find the slopes of the lines.

Find slope of \overleftrightarrow{AB} with $(x_1, y_1) = (4, 2)$ and $(x_2, y_2) = (-3, 1)$.

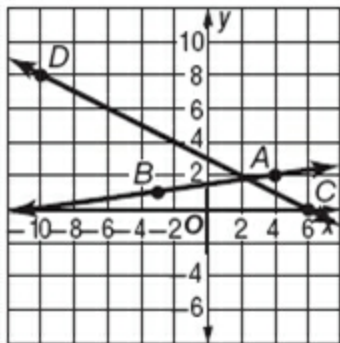
$$\begin{aligned} m_1 &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{1 - 2}{-3 - 4} \\ &= \frac{-1}{-7} \\ &= \frac{1}{7} \end{aligned}$$

Find slope of \overleftrightarrow{CD} with $(x_1, y_1) = (6, 0)$ and $(x_2, y_2) = (-10, 8)$.

$$\begin{aligned} m_2 &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{8 - 0}{-10 - 6} \\ &= \frac{8}{-16} \\ &= -\frac{1}{2} \end{aligned}$$

The two lines neither have equal slopes nor is their product -1 . Therefore, the lines are neither parallel nor perpendicular.

Graph the lines on a coordinate plane to verify the answer.



2-8 Slope and Equations of Lines

34. $A(8, 4)$, $B(4, 3)$, $C(4, -9)$, $D(2, -1)$

SOLUTION:

Substitute the coordinates of the points in slope formula to find the slopes of the lines.

Find slope of \overleftrightarrow{AB} with $(x_1, y_1) = (8, 4)$ and $(x_2, y_2) = (4, 3)$.

$$\begin{aligned} m_1 &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{3 - 4}{4 - 8} \\ &= \frac{-1}{-4} \\ &= \frac{1}{4} \end{aligned}$$

Find slope of \overleftrightarrow{CD} with $(x_1, y_1) = (4, -9)$ and $(x_2, y_2) = (2, -1)$.

$$\begin{aligned} m_2 &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{-1 - (-9)}{2 - 4} \\ &= \frac{8}{-2} \\ &= -4 \end{aligned}$$

The product of the slopes of the lines is -1 . Therefore, the lines are perpendicular.

Graph the lines on a coordinate plane to verify the answer.

