

6.1

Linear Relations

Lesson 2

Connect

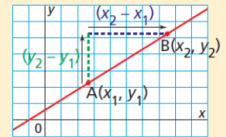
NOTES:

How to find the slope using 2 points on a line

Slope of a Line

A line passes through $A(x_1, y_1)$ and $B(x_2, y_2)$.

$$\text{Slope of line AB} = \frac{y_2 - y_1}{x_2 - x_1}$$



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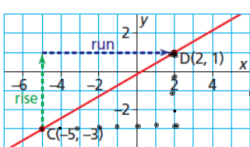
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Practice

EXAMPLE 1

Determine the slope of the line that passes through $C(-5, -3)$ and $D(2, 1)$

Step 1 - Draw a graph

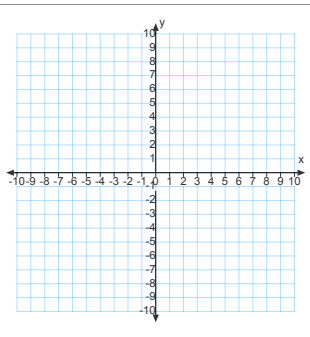


$$\begin{aligned} \text{Slope} &= \frac{\Delta y}{\Delta x} \\ &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{1 - (-3)}{2 - (-5)} \\ &= \frac{4}{7} \end{aligned}$$

Practice

YOU TRY!

Determine the slope of the line that passes through $E(4, -5)$ and $F(8, 6)$



$$\begin{aligned} \text{Slope} &= \frac{\Delta y}{\Delta x} \\ m &= \frac{y_2 - y_1}{x_2 - x_1} \\ m &= \frac{-5 - 6}{4 - 8} \\ &= \frac{-11}{-4} \\ |m| &= 11/4 \end{aligned}$$

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Practice **EXAMPLE 2**

a) What is the slope of the line through these points?

$$\frac{\text{Rise}}{\text{Run}} \quad \left\{ \quad m = \frac{\Delta y}{\Delta x} \right.$$

$$\frac{24}{1} \quad \left\{ \quad = \frac{48 - 24}{2 - 1} \right.$$

$$24 \quad \left\{ \quad = \frac{24}{1} = 24 \right.$$

b) What does the slope represent?

Distance traveled in hours.

km/hour

Graph of a Bicycle Ride

Practice **EXAMPLE 2**

c) How can the answer to part b be used to determine:

i) How far did the person travel in 1.75 hours?

$$\frac{24}{1} = \frac{x}{1.75} \quad \rightarrow \quad 42 = x$$

$$1.75 \left[\frac{24}{1} \right] = 1.75 \left[\frac{x}{1.75} \right]$$

ii) The time it took the person to travel 55 km?

$$\frac{24}{1} = \frac{55}{x}$$

$$x \left[\frac{24}{1} \right] = x \left[\frac{55}{x} \right] \quad \rightarrow \quad \frac{24x}{24} = \frac{55}{24} \quad \boxed{x = 2.916}$$

Graph of a Bicycle Ride

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Practice **YOU TRY!**

a) What is the slope of the line through these points?

(2, 24), (4, 48)

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

$$= \frac{48 - 24}{4 - 2}$$

$$= \frac{24}{2} = 12$$

b) What does the slope represent?

\$/h Pay per hour

Graph of Tom's Pay

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Practice **YOU TRY!**

c) How can the answer to part b be used to determine:

i) How much did Tom earn in 3.5 hours?

$$\$12 \times 3.5$$

$$\boxed{\$42}$$

ii) The time it took Tom to earn \$30?

$$\frac{\$30}{\$12} = 2.5 \text{ hours}$$

Graph of Tom's Pay

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Find slope 3 ways

① Given 2 points $\frac{y_2 - y_1}{x_2 - x_1}$

② Given a Graph ① $\frac{\text{Rise}}{\text{Run}}$

② $\frac{y_2 - y_1}{x_2 - x_1}$

③ Given table of values $\frac{y_2 - y_1}{x_2 - x_1}$ $\frac{\Delta y}{\Delta x}$

Practice

HOMEWORK!

Textbook Questions:

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