

Warm-Up

Exploring Slope



Lesson Question



Lesson Goals

Recognize different types of slopes.

Determine the value of a slope

from a .

Determine the value of a slope

from a .



Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you.

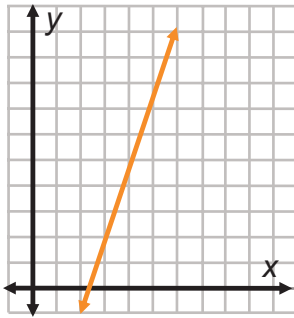
	to determine the value of
	the amount of change in output that occurs based on change in input
	the ratio of the change in the dependent values (outputs) to the change in the independent values (inputs) between two points on a line
	an imagined or projected sequence of events

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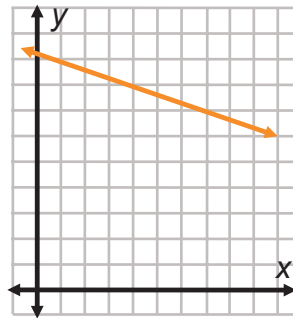


Identify Trends in Graphs

Examine the graphs. What can you tell about the data?

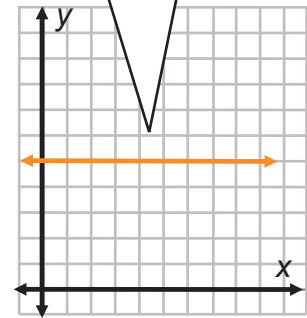


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The graph is horizontal.
The rate of change is 0.



• Neither increasing nor decreasing

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Differentiating Positive and Negative Slope

This table represents the **scenario** of a change in water temperature over time, where x is seconds and y is the Fahrenheit temperature.

Determine from the table if the **rate** is increasing, decreasing, or neither.

Evaluate the **slope** for this scenario.

x	y
$x_1 = 3$	$y_1 = 70$
6	75
$x_2 = 9$	$y_2 = 80$
12	85
15	90

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

$$= \frac{80 - \boxed{}}{\boxed{} - 3}$$

$$= \frac{10}{6}$$

$$\text{Slope} = \frac{\boxed{}}{3}$$

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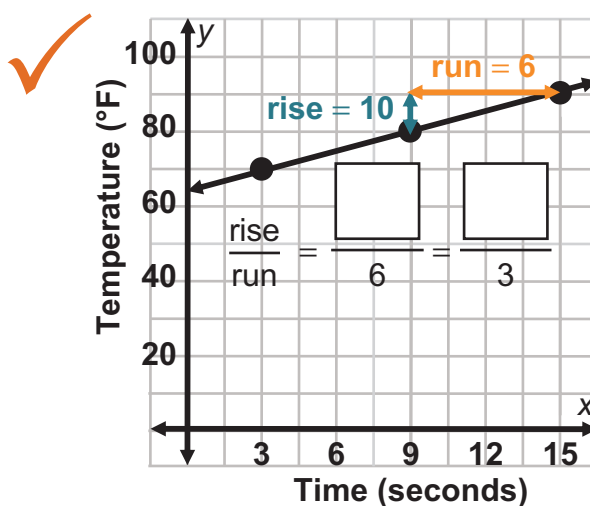
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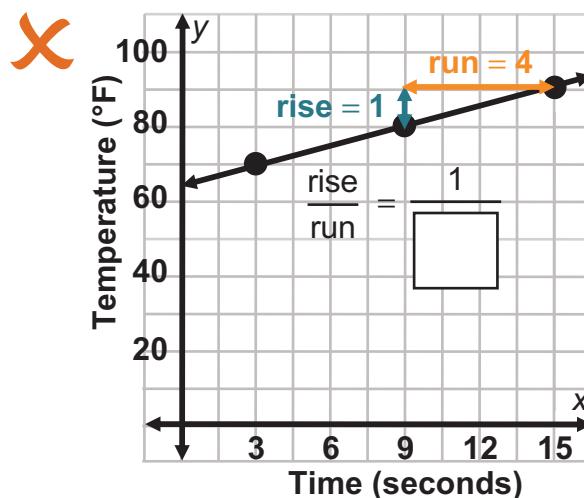
Using the Scale vs. Using the Squares

MISCONCEPTION

Using the *scale* when counting $\frac{\text{rise}}{\text{run}}$ to find slope.



Using the *squares* when counting $\frac{\text{rise}}{\text{run}}$ to find slope.



When you're trying to use rise over run, you want to make sure you absolutely use the . You want to never simply count the .

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Differentiating Positive and Negative Slope

In this table, x represents months and y represents value of a car.

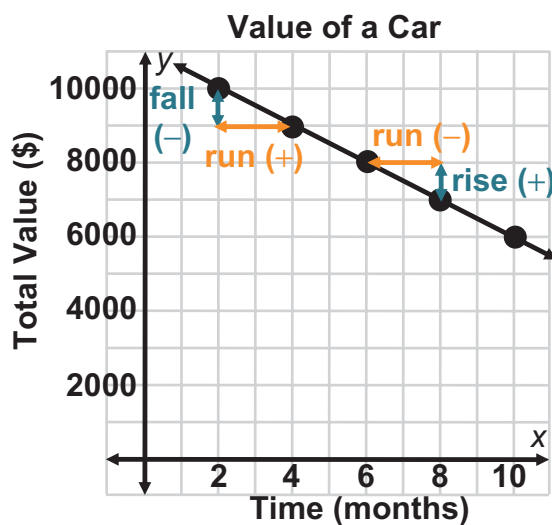
x	y
2	10,000
4	9,000
6	8,000
8	7,000
10	6,000

Determine from the table if the rate is increasing, decreasing, or neither.

What is the slope for this scenario?

$$\begin{aligned} \text{Slope} &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{7000 - \boxed{}}{8 - 2} \\ &= \frac{-3000}{6} \\ &= \boxed{} \end{aligned}$$

As the values of x increase, the values of y decrease, so we say the rate is



The graph of the value of a car represents a **negative** slope of -500 .

- What is the slope?

$$\frac{\text{fall}}{\text{run}} = \frac{-1000}{\boxed{}} = \boxed{}$$

When the graph of a line falls from left to right, that line has a slope.

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Positive vs. Negative Slope in the Real World

Positive Slope



Negative Slope



Examples of and negative slopes can be found everywhere in the world around us.

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Positive, Negative, and Zero Slopes

In the table, x represents hours and y represents the speed of a car.

x	y
$x_1 = 1$	$y_1 = 55$
3	55
$x_2 = 5$	$y_2 = 55$
7	55
9	55

Determine from the values in the table if the rate is increasing, decreasing, or neither.

What is the slope for this scenario?

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

We'll choose two points from the table.

$$\text{Slope} = \frac{55 - \boxed{}}{5 - 1} = \frac{0}{4} = \boxed{}$$

Lines that have a slope of 0, as you extend from left to right, are horizontal.

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- Slope
 - $\frac{\text{rise}}{\text{run}}$

$$\frac{\text{rise}}{\text{run}} = \frac{\boxed{}}{\boxed{}} = \boxed{}$$

All horizontal lines as you extend from left to right have a slope of 0.

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Positive, Negative, Zero, and No Slope

In the table, x represents time in seconds and y represents the distance (in feet) a ball is from the ground.

x	y
$x_1 = 2$	$y_1 = 8$
$x_2 = 2$	$y_2 = 13$

What is the slope?

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

$$\text{Slope} = \frac{\boxed{} - 8}{2 - 2} = \frac{\boxed{}}{0}$$

$\boxed{}$ Slope

We can never divide a number by 0, so we have no $\boxed{}$ at 2 seconds.

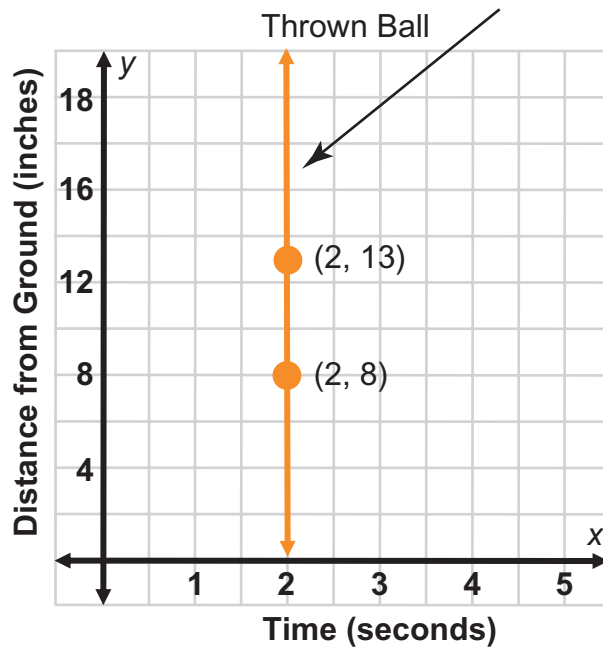
This would mean that the ball is two different distances off of the ground, which is not possible.

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- Slope

- $\frac{\text{rise}}{\text{run}}$

$$\frac{\text{rise}}{\text{run}} = \frac{\boxed{}}{0} = \text{no slope}$$

We have no slope. Any vertical line has slope, or we can say the slope

is .

Summary

Exploring Slope



**Lesson
Question**

How are slopes different from each other?



Answer

Use this space to write any questions or thoughts about this lesson.