January 20, 2016 TPA Lesson 14.5

Learning Objective: Students will be able to define slope and determine the slope of a line from its graph.

Warm Up

$\frac{18}{22} =$ $\frac{50}{60} =$ $\frac{12}{14} =$ $\frac{9}{63} =$

$\frac{54}{81} =$ $\frac{81}{90} =$ $\frac{36}{60} =$ $\frac{14}{49} =$

$\frac{12}{18} =$ $\frac{16}{24} =$ $\frac{3}{24} =$ $\frac{14}{77} =$

$\frac{7}{42} =$ $\frac{36}{60} =$ $\frac{12}{20} =$ $\frac{15}{55} =$

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Warm Up Answers

$\frac{18}{22} = \frac{9}{11}$ $\frac{50}{60} = \frac{5}{6}$ $\frac{12}{14} = \frac{6}{7}$ $\frac{9}{63} = \frac{1}{7}$

$\frac{54}{81} = \frac{2}{3}$ $\frac{81}{90} = \frac{9}{10}$ $\frac{36}{60} = \frac{3}{5}$ $\frac{14}{49} = \frac{2}{7}$

$\frac{12}{18} = \frac{2}{3}$ $\frac{16}{24} = \frac{2}{3}$ $\frac{3}{24} = \frac{1}{8}$ $\frac{14}{77} = \frac{2}{11}$

$\frac{7}{42} = \frac{1}{6}$ $\frac{36}{60} = \frac{3}{5}$ $\frac{12}{20} = \frac{3}{5}$ $\frac{15}{55} = \frac{3}{11}$

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Lesson 14.3 January 20, 2016

Essential Question:

How can you compare two rates graphically?

Lesson 14.3

January 20, 2015

Lesson Objective:

Students will be able to:

define slope and determine the slope of a line from its graph.

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Self-Evaluation Scale

Score	Description
4	I can teach other students how to define slope and determine the slope of a line from its graph.
3	I can define slope and determine the slope of a line from its graph.
2	I recognize, but still need help to define slope and determine the slope of a line from its graph.
1	I do not know how to define slope and determine the slope of a line from its graph.

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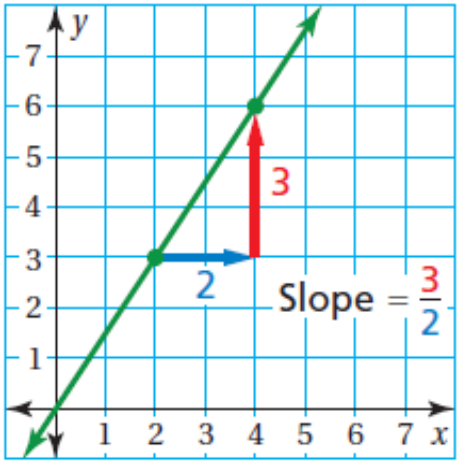
Key Idea

Slope

Slope is the rate of change between any two points on a line. It is a measure of the *steepness* of a line.

To find the slope of a line, find the ratio of the change in y (vertical change) to the change in x (horizontal change).

$$\text{slope} = \frac{\text{change in } y}{\text{change in } x}$$



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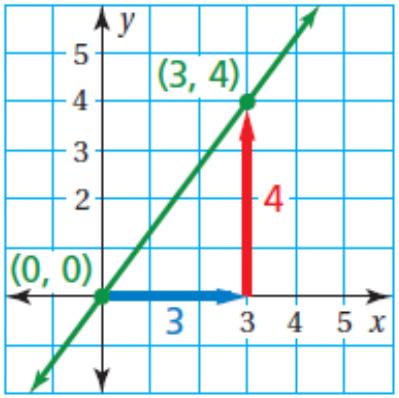
1 Finding Slopes

Find the slope of each line.

a.

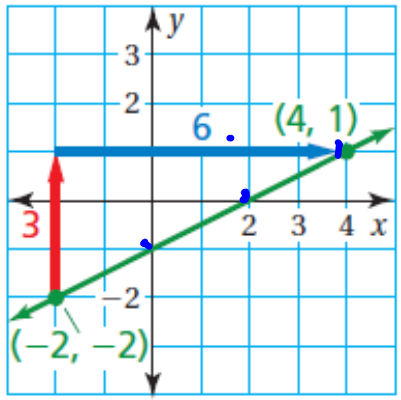


$$\text{slope} = \frac{\text{change in } y}{\text{change in } x}$$

$$= \frac{4}{3}$$

∴ The slope of the line is $\frac{4}{3}$.

b.



$$\text{slope} = \frac{\text{change in } y}{\text{change in } x}$$

$$= \frac{3}{6} = \frac{1}{2}$$

∴ The slope of the line is $\frac{1}{2}$.

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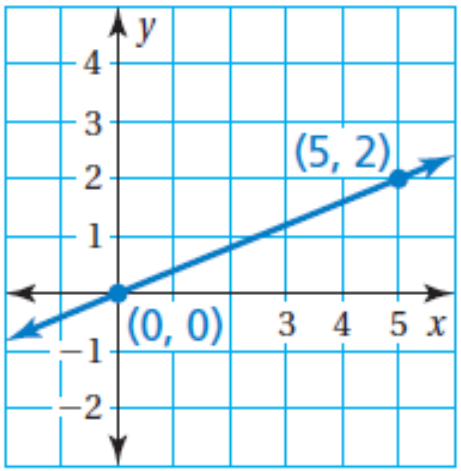
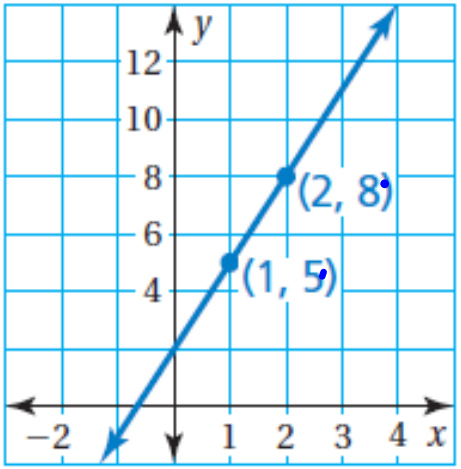
OYO!

Find the slope of the line.

1.



2.



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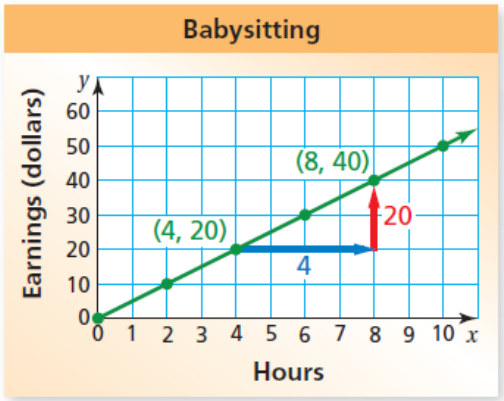
2 Interpreting a Slope

The table shows your earnings for babysitting.

a. Graph the data.

b. Find and interpret the slope of the line through the points.

Hours, x	0	2	4	6	8	10
Earnings, y (dollars)	0	10	20	30	40	50



a. Graph the data. Draw a line through the points.

b. Choose any two points to find the slope of the line.

$$\text{slope} = \frac{\text{change in } y}{\text{change in } x}$$

$$= \frac{20}{4} \quad \leftarrow \text{dollars}, \quad \leftarrow \text{hours}$$

$$= 5$$

∴ The slope of the line represents the unit rate.
The slope is 5. So, you earn $5 per hour babysitting.

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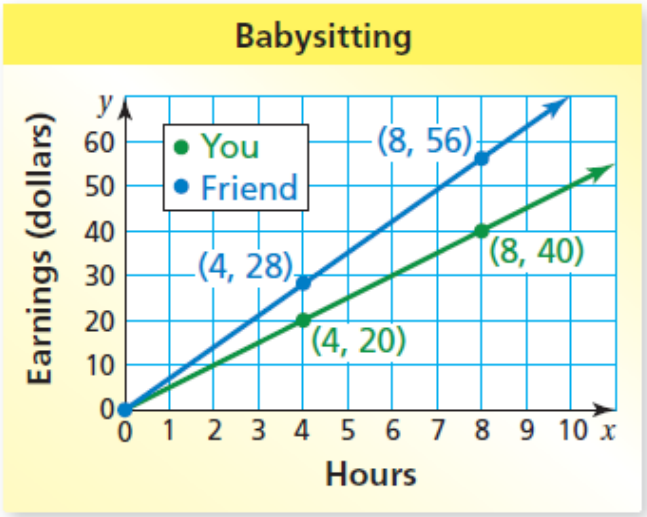
OYO!

3. In Example 2, use two other points to find the slope. Does the slope change?

4. The graph shows the amounts you and your friend earn babysitting.



a. Compare the steepness of the lines. What does this mean in the context of the problem?

b. Find and interpret the slope of the blue line.

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Assignment

Complete problems:

4, 6, 8, 10, 16, & 18

on pages 632 - 633 in your Big Ideas Text Book.

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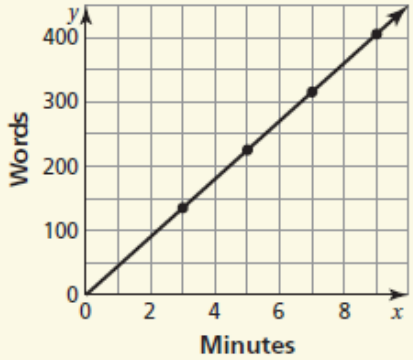
Assignment Answers

4. 4

6. $\frac{1}{3}$

8. $\frac{3}{4}$

10.

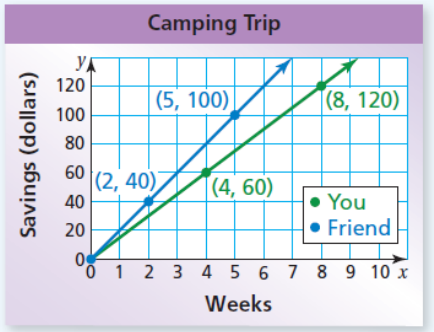


slope = 45; 45 words per minute

18. 0; The change in y is 0 because the y-values do not change. So, the slope is 0.

This is a classic type of problem that uses linear models to predict future events. Each person is saving money at a constant rate (constant slope). The fact that the rate is constant is what makes the graph a line. The prediction of when \$165 will be saved assumes that the constant rate continues into the future.

1 Interpret the slope in context.



a. Your friend's graph is steeper than yours. So, your friend's saving rate (in dollars per week) is greater than yours.

2 Find the slope of each line.

b. Slopes Rates

You: $\frac{60}{4}$ = \$15 per week

Friend: $\frac{60}{3}$ = \$20 per week

c. Your friend saves \$20 − \$15 = \$5 more per week.

3 How long will it take for you to save \$165?

d. At \$15 per week, it will take $\frac{165}{15}$ = 11 weeks.

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Homework

In your Big Ideas Record and Practice Journal page 326.

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