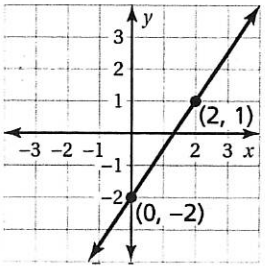
Name _____ Date _____

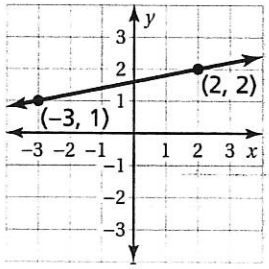
4.2 Puzzle Time

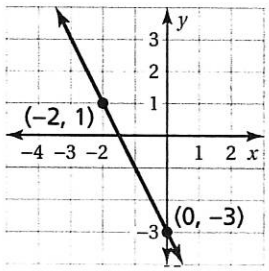
What Did One Poppy Seed Say To The Other?

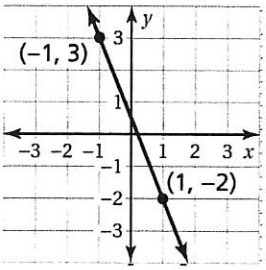
Circle the letter of each correct answer in the boxes below. The circled letters will spell out the answer to the riddle.

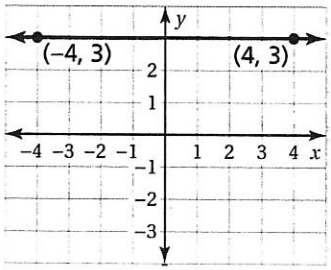
Find the slope of the line through the given points.

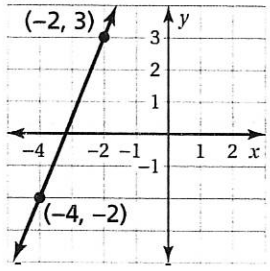
1. 

2. 

3. 

4. 

5. 

6. 

7. $(1, 4), (3, -2)$

8. $(1, 2), (1, -2)$

9.

x	−5	−3	3	5
y	15	7	−17	−25

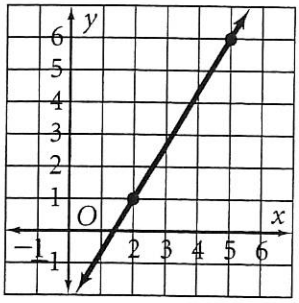
I	T	M	S	A	O	N	H	A	P	L	R	O	M	E	L	S	L
−2	$\frac{2}{5}$	0	$\frac{1}{6}$	$\frac{4}{3}$	$\frac{1}{5}$	−3	$\frac{1}{4}$	$\frac{3}{2}$	$\frac{1}{50}$	1	−4	$\frac{5}{2}$	$-\frac{1}{3}$	2	$-\frac{5}{2}$	5	und.

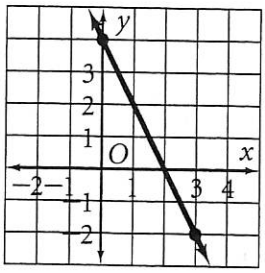
Name _____ Class _____ Date _____

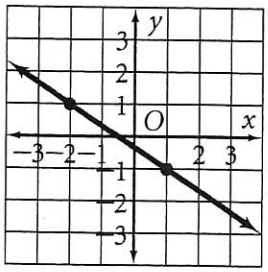
Practice 6-1

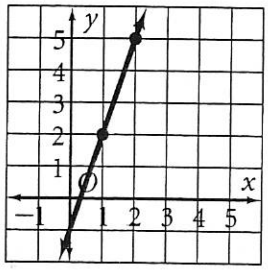
Rate of Change and Slope

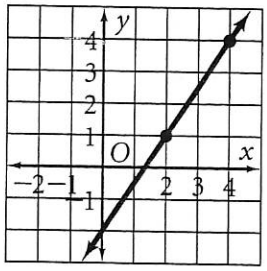
Find the slope of each line.

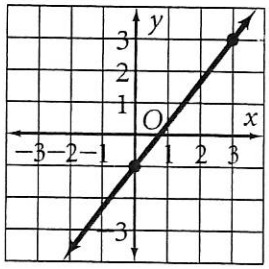
1. 

2. 

3. 

4. 

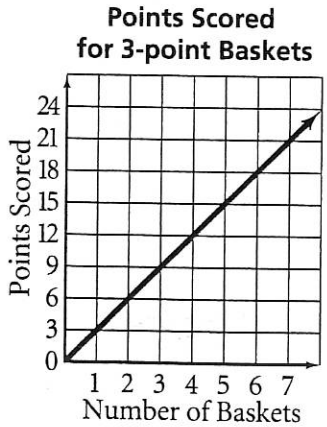
5. 

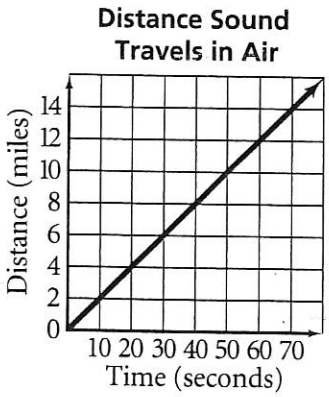
6. 

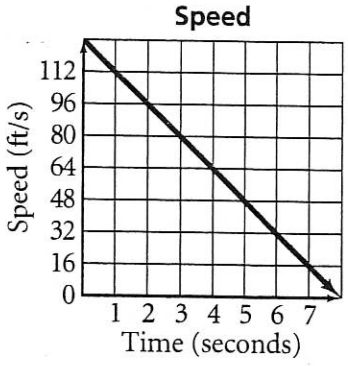
Find the slope of the line that passes through each pair of points.

7. (1, 2), (4, 3)
8. (7, 2), (3, 5)
9. (0, 2), (4, 6)
10. (−2, 5), (3, −4)
11. (2, 4), (6, 7)
12. (−2, −5), (4, 5)
13. (−3, −2), (4, −2)
14. (4, −2), (4, 9)
15. (5, 2), (8, −4)

Find the rate of change. Explain what the rate of change means for each situation.

16. 

17. 

18. 

Find the slope of the line that passes through each pair of points.

19. (0, 0), (3, 7)
20. (−2, 4), (4, −1)
21. (−3, 6), (1, −2)
22. (2, 4), (4, −4)
23. (2, −10), (5, −6)
24. (5, 1), (11, 1)
25. (3, 7), (3, 5)
26. (7, 9), (2, 9)
27. (−5, −2), (−5, 3)

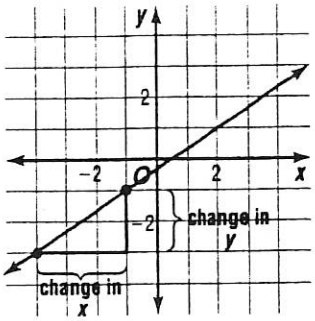
NAME _____ DATE _____

8-6 Study Guide
Slope

Student Edition
Pages 400–404

The steepness of a line is called its **slope**. The vertical change is called the **change in y**, and the horizontal change is called the **change in x**.

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



Example: In the graph above, the change in y is 2, and the change in x is 3. Therefore, the slope of the line is $\frac{2}{3}$.

The slope of a line can also be found by using the coordinates of any two points on the line.

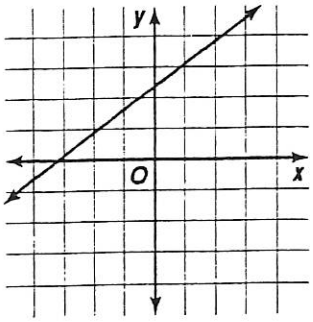
$$\text{slope} = \frac{\text{change in } y}{\text{change in } x} \text{ or } \frac{\text{difference in } y\text{-coordinates}}{\text{difference in } x\text{-coordinates}}$$

Example: Find the slope of the line that contains the points $A(-1, -2)$ and $B(-4, -3)$.

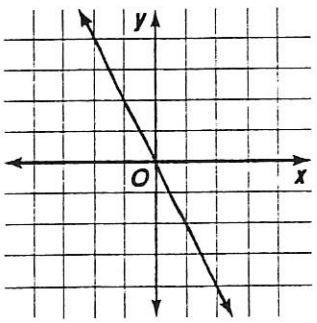
$$\text{slope} = \frac{-2 - (-3)}{-1-(-4)} = \frac{-2 + 3}{-1 + 4} \text{ or } \frac{1}{3}$$

Find the slope of each line.

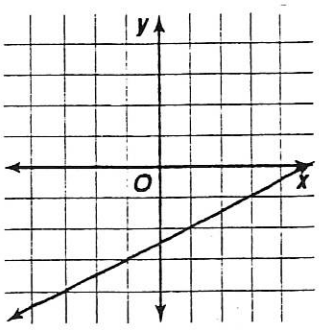
1.



2.



3.



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

4. $R(-2, -3), S(-1, -1)$
5. $T(-4, -2), U(-2, -1)$
6. $V(-4, 1), W(2, 0)$
7. $P(1, -2), Q(-5, -2)$
8. $L(1, 4), M(1, -3)$
9. $M(-2, -4), N(-1, -1)$

NAME _____

Lesson 3.1 Understanding Slope

The **slope** of a line on a coordinate grid can be found by determining the **rate of change**.

Michael keeps track of the number of yards he mows for 5 days.

	Day 1	Day 2	Day 3	Day 4	Day 5
Number of Lawns	1	3	6	8	13
Amount Earned ($)	20	60	120	160	260

Find the slope, or rate of change, by dividing the rate of change for the dependent variable (amount earned) by the rate of change for the independent variable (number of lawns).

$$\frac{\text{change in money earned}}{\text{change in \# of lawns}} = \frac{60 - 20}{3 - 1} = \frac{40}{2} = 20$$

$$\frac{\text{change in money earned}}{\text{change in \# of lawns}} = \frac{260 - 160}{13 - 8} = \frac{100}{5} = 20$$

The rate of change, or slope, in this situation is 20 and is **constant**.

Find the slope, or rate of change for each situation. Be sure to show your work.

1. Students are buying tickets for the fall dance. The student council keeps track of how many tickets they sell in one week.

	Monday	Tuesday	Wednesday	Thursday	Friday
Number of Tickets Sold	10	15	23	28	32
Amount Earned ($)	50	75	115	140	160

The rate of change, or slope, for this situation is _____.

2. Jean planted a sunflower. She decided to measure how much it grew each week.

Time (weeks)	1	2	3	4
Height (cm)	16.2	20.4	24.6	28.8

The rate of change, or slope, for this situation is _____.

NAME _____

Lesson 3.1 Understanding Slope

Sometimes a rate of change is **variable**, or changes as data is collected.

Samantha kicks a ball and records a video of the ball's path so she can observe its path.

Time (s)	0	1	2	3	4
Height (m)	0	5.5	9.1	6	2

Find the slope, or rate of change, by dividing the rate of change for the dependent variable (time) by the rate of change for the independent variable (height).

$$\frac{\text{change in time}}{\text{change in height}} = \frac{2-1}{9.1-5.5} = \frac{1}{3.6}$$

$$\frac{\text{change in time}}{\text{change in height}} = \frac{4-3}{6-2} = -\frac{1}{4}$$

The rate of change, or slope, in this situation is **variable** because it changes from one data collection point to another.

Determine if each slope, or rate of change, is *constant* or *variable*. Show your work.

1. Eric walks to his friend's house.

Time (minutes)	5	10	15	20
Distance Traveled (miles)	0.25	0.5	0.75	1

The rate of change for this situation is _____.

2. Cindy went for a bike ride through town.

Time (minutes)	5	10	15	20
Distance Traveled (miles)	1.0	1.5	2.3	2.5

The rate of change for this situation is _____.

NAME _____

Lesson 3.1 Understanding Slope

Determine if each slope, or rate of change, is *constant* or *variable*. Show your work.

1. Johnson is ordering t-shirts for his school. The more he orders, the lower the cost per shirt is.

Number of T-Shirts	100	200	300	400	500
Total Cost ($)	500	900	1200	1400	1500

The rate of change for this situation is _____.

2. Bike rental costs $10 per hour.

Time (hours)	1	2	3	4	5
Cost ($)	10	20	30	40	50

The rate of change for this situation is _____.

3. Miles a plane traveled while flying.

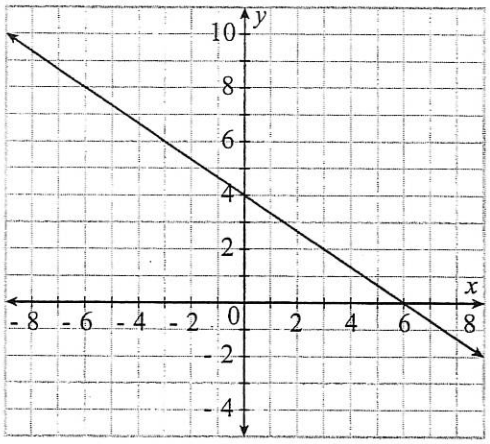
Time (minutes)	20	40	60	80	100
Distance (miles)	180	360	540	720	900

The rate of change for this situation is _____.

Name _____ Date _____

Investigating Slope

The graph shows the linear function $y = -\frac{2}{3}x + 4$.



1. Find the slope of the line using the points (0, 4) and (-3, 6).

_____

2. Find the slope of the line using a different pair of points on the line.

_____

3. Find the slope of the line using another pair of points on the line.

_____

4. What does slope represent?

_____

5. Does it matter which pair of points you use when finding the slope of a line? Explain.

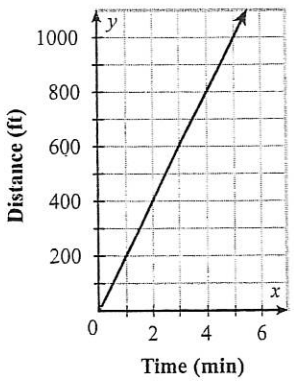
_____

_____

Name _____ Date _____

Applications of Slope

Erica walks to her friend Philip's house at a constant pace. The graph shows Erica's distance from home over time.



1. Without calculating slope, tell whether the slope is positive or negative.

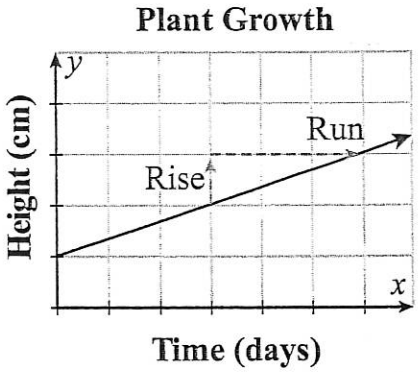
_____

2. Find the slope of the line. _____

3. Does the value of r in the point $(1, r)$ correspond to Erica's unit rate? Explain.

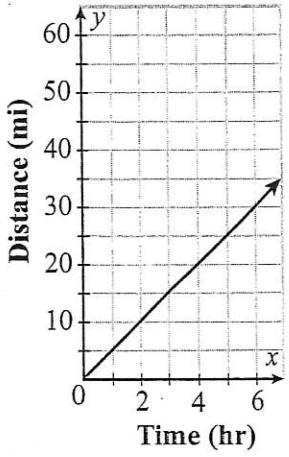
_____

4. What are the rate of change and the slope of the line shown in this graph?



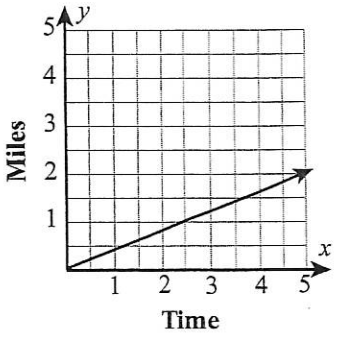
_____

5. What are the rate of change and the slope of the line shown in this graph?



_____

6. What are the rate of change and slope of the line shown in this graph?

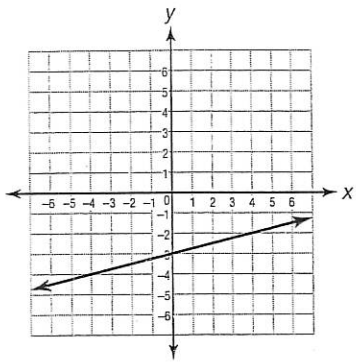


_____

Lesson Practice

Choose the correct answer.

1. What is the slope of this line?



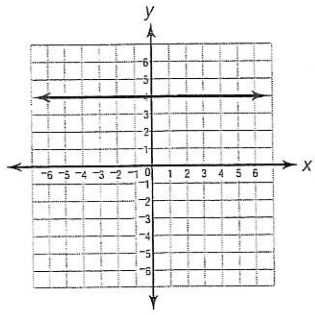
A. -4

B. $-\frac{1}{4}$

C. $\frac{1}{4}$

D. 4

2. Which is true of this graph?



A. The slope is 0.

B. The slope is 1.

C. The slope is 4.

D. The slope is undefined.

3. What is the slope of a line that passes through $(2, -5)$ and $(6, -2)$?

A. $-\frac{4}{3}$

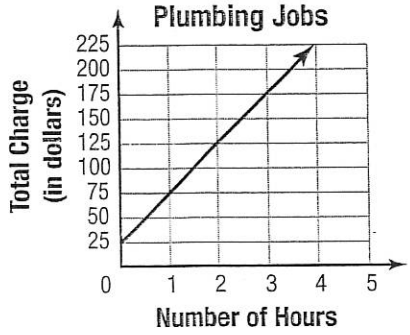
B. $-\frac{3}{4}$

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

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

Use the graph for questions 4 and 5.

A plumber charges a set fee for each house call plus an hourly rate, as shown by the graph below.



4. What is the slope of the line graphed above?

A. 100

B. 75

C. 50

D. 25

5. What does the slope of the graph represent?

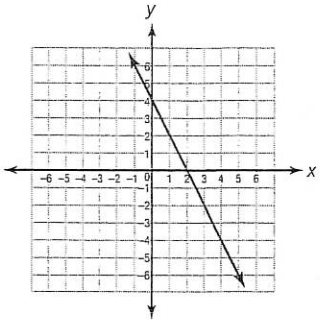
A. the cost of materials for each plumbing job

B. the total charge for any plumbing job

C. the set fee for any plumbing job

D. the hourly rate charged by the plumber

6. What is the slope of this line?



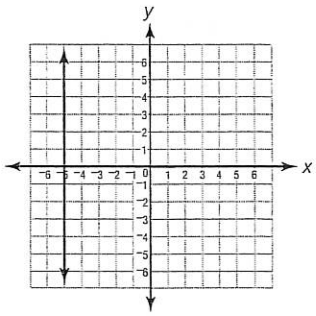
A. -2

B. $-\frac{1}{2}$

C. $\frac{1}{2}$

D. 2

7. Which is true of this graph?



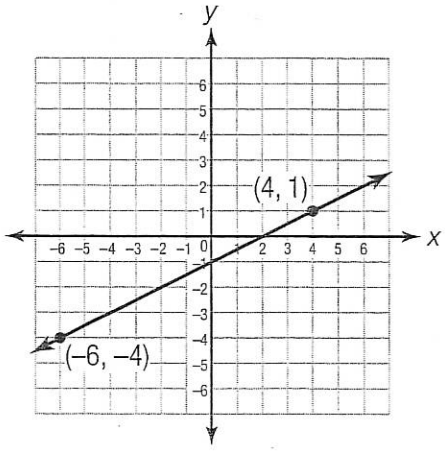
A. The slope is -5.

B. The slope is 0.

C. The slope is 1.

D. The slope is undefined.

8. Consider the line graphed below.



A. Using the two points labeled on the graph above, calculate its slope. Show your work.

B. Does the slope of the line change depending on which two points you use? Calculate the slope using two different points to support your answer.