6.3 Rate of Change (Slope)

NOTES

Warm Up:
Which section of the ski lift is the steepest? Guess.

Explain & prove.
Be prepared to debate your theory tomorrow in class.

ALGEBRA

Write your questions here!

Verbally
Algebraically
Numerically → points and tables
Graphically

$m = \frac{rise}{run}$ Find the slope! $m = \frac{y_2 - y_1}{x_2 - x_1}$

VANG

Verbally i.e. Words

Bob has 40 skittles. He eats 5 skittles every 3 minutes.

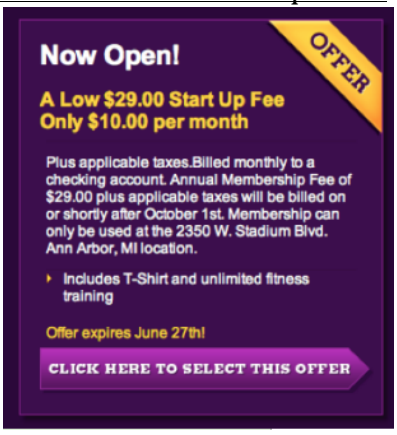
Sarah runs 3 miles every 24 minutes. She has already 5 miles.

Algebraically i.e. Equation

Remember the 3.3 interactive lessons:

Planet Fitness - What was the slope in this equation?

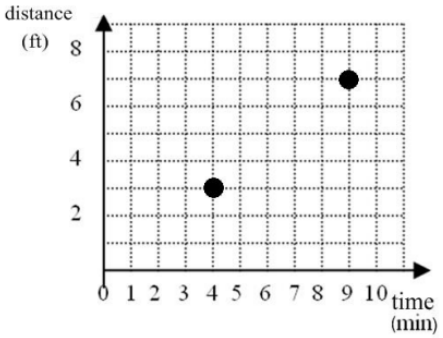
Crazy Taxi - What was the slope in that equation?



$y = \frac{3}{4}x + 1$ | $y = 2 - \frac{2}{5}x$

Numerically

i.e. Points & Tables



SLOPE $m =$

POINTS

(12, 16) and (-20, 4)

(21, -10) and (7, 24)

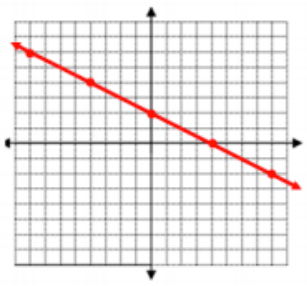
x	y
0	3
1	7
2	11
3	15
4	19

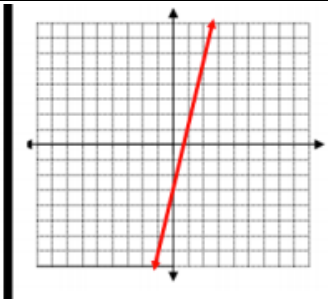
x	y
-2	22
1	17
4	12
7	7
10	2

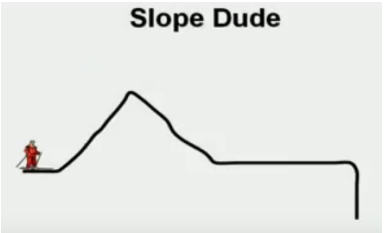
x	y
-8	6
4	12
14	17

Graphically

i.e. Coordinate Plane







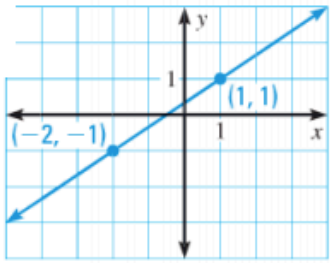
SUMMARY:

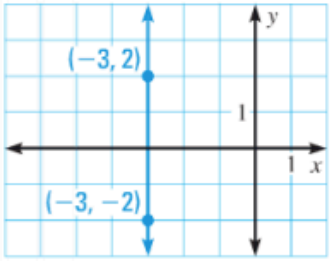
Now, summarize your notes here!

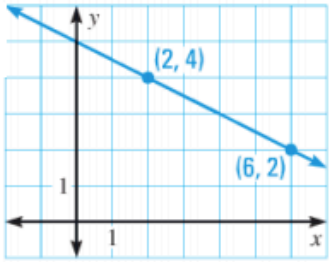
6.3 Rate of Change (Slope)

PRACTICE

Tell whether the slope of the line is positive, negative, zero or undefined. Then find the slope if it exists.

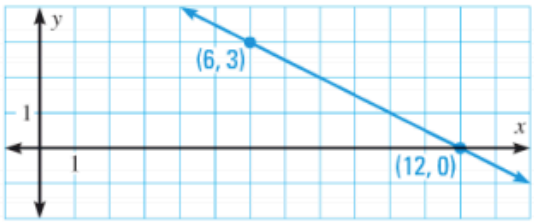
1. 

2. 

3. 

4. **ERROR ANALYSIS** *Describe* and correct the error in calculating the slope of the line shown.

$$m = \frac{12 - 6}{0 - 3} = \frac{6}{-3} = -2$$



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

5. (-2, -1) and (4, 5)

6. (1, 3) and (3, -2)

7. (1, -3) and (7, 3)

8. (-9, 1) and (1, 1)

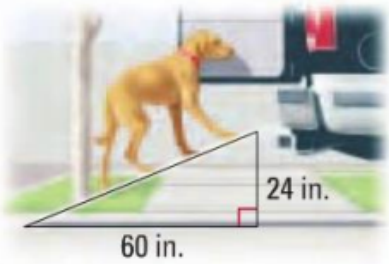
9. ★ **MULTIPLE CHOICE** The slope of the line that passes through the points (−2, −3) and (8, −3) is ___?___.

Ⓐ positive Ⓑ negative Ⓒ zero Ⓓ undefined

Find the slope of the object.

10. Skateboard ramp

11. Pet ramp



12. Boat ramp

Find the slope (rate of change) for the following.

13. Mr. Brust has 50 algebra books. He handouts 2 books every 3 days.

Slope (rate of change) =

LABEL IT!

14. Bob makes 40 dollars a week. He already has 200 dollars.

Slope (rate of change) =

LABEL IT!

15. $y = 7 + \frac{3}{2}x$

Slope (rate of change) =

16. $y = -3x + 5$

Slope (rate of change) =

17.

x	y
0	2
1	11
2	20

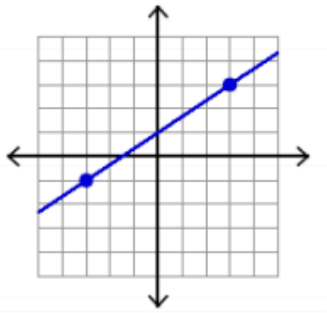
Slope (rate of change) =

18.

x	y
0	0
2	1
4	2

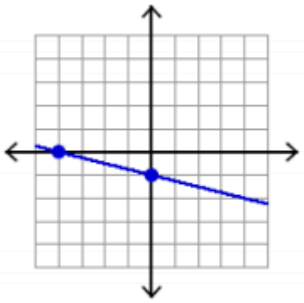
Slope (rate of change) =

19.



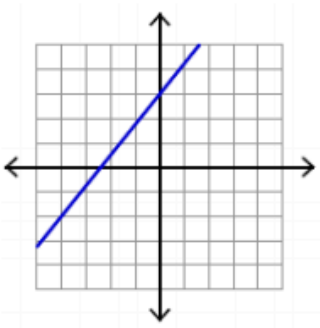
Slope (rate of change) =

20.



Slope (rate of change) =

21.



Slope (rate of change) =

22. Find the slope of the linear relationship below.

Time (min)	7	11	16	31
Distance (ft)	137	209	299	569

23. Find the slope of the linear relationship below.

Gallons of Gas	5	9	10	15
Cost	$13.80	$24.84	$27.60	$41.40

24. **WATER** At 2 P.M., the level of the water in the pool was 10 feet. At 6 P.M., the level of water was 2 feet. Find the rate of change of the water.

25. **MONEY** JoAnne is depositing money into a bank account. After 3 months there is $150 in the account. After 6 months, there is $300 in the account. Find the rate of change of the account.

26. Find the slope in the following equation.

$y = 3 - 15x$

27. Find the slope in the following equation.

$y = \frac{7}{9}x - 11$

SKILLZ REVIEW

1. Find the sale price of an item marked down by 15% that was originally $350.

2. If your food bill came out to $32.67 at Denny's. What would a 20% tip be approximately?

SIMPLIFY

3. $6(3x + 2) - 10$

4. $5x - 3(4x + 1)$

SOLVE

5. $8 - x = 12$

6. $5x - 4 = 8x + 3$

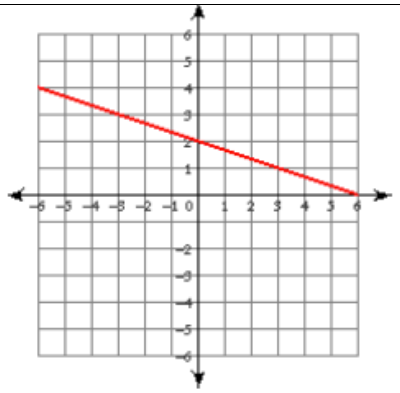
6.3 Rate of Change (Slope)

APPLICATION

Find the slope of the following:

1. (-5, -7) and (14, -24)

2.



Find the slope (rate of change) of the following and label your answer (like miles per hour)

3.

Time (seconds)	Profit (dollars)
3	18
5	25
7	32

$m =$

4.

Time (days)	Weight (grams)
-3	40
1	32
5	24

$m =$

5.

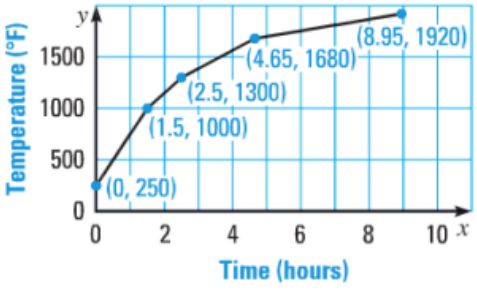
Age (years)	Height (cm)
5	80
15	120
20	140

$m =$

6. Firing a piece of pottery in a kiln takes place at different temperature for different amounts of time. The graph shows the temperature in a kiln while firing a piece of pottery (note: oven was preheated)

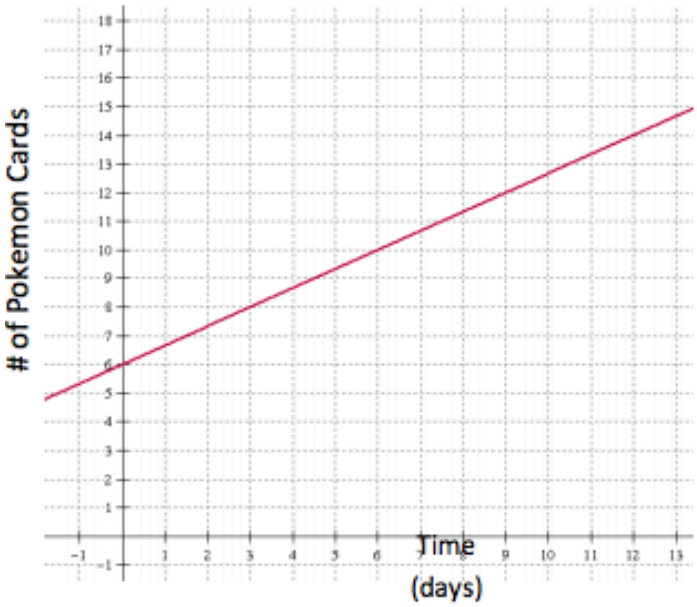
a. Determine the time interval during which the temperature in the kiln showed the greatest rate of change.

b. Determine the time interval during which the temperature in the kiln showed the least rate of change.



Brust, Sully, and Kelly love to play Pokemon. Answer the following:

7. Mr. Brust's Pokémon cards are shown in the graph.



a. What is Mr. Brust's slope?

b. What does his slope mean? (AKA describe his rate of change in a sentence using labels)

c. How many cards does Mr. Brust have after 9 days?

d. When will Mr. Brust have 14 cards?

e. What is the y-intercept? What does it mean?

8. Mr. Sullivan's Pokémon cards are shown in the table.

Time (days)	Cards #
0	20
2	16
4	12
6	8
8	4

a. What is Mr. Sullivan's slope?

b. What does his slope mean?
(AKA describe his rate of change in sentence using labels.)

c. What is Mr. Sullivan *y*-intercept?

d. What does Mr. Sullivan *y*-intercept mean in this problem?

9. Mr. Kelly's Pokémon cards are determined by the equation.

$$y = \frac{2}{5}x + 2$$

a. What is Mr. Kelly's slope?

b. What does his slope mean?
(AKA describe his rate of change in sentence using labels.)

c. How many cards will Mr. Kelly have in 40 days? SHOW WORK!

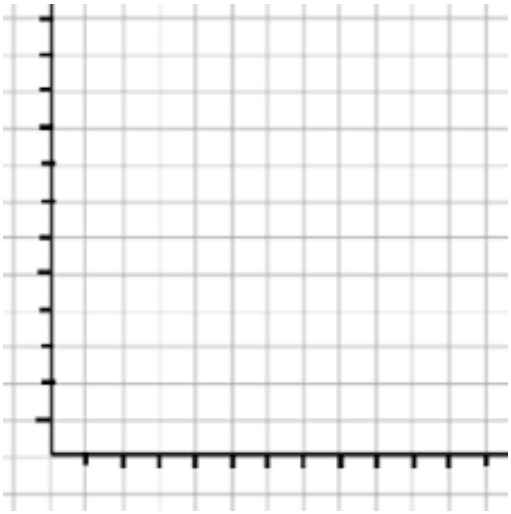
d. When will Mr. Kelly have 8 cards? SHOW WORK!

10. Look back at the Pokémon questions 7-9. Who is the best player? Explain why. Who is the worst player? Explain why

11. Lisa is playing games at the arcade Lisa started with $13, and her machine costs $0.50 per game.

a) Fill in the table. Then graph. LABEL the axis

# of Games Played		**Money Left**
x		y
0		
1		
2		
3		
4		
20		
g		

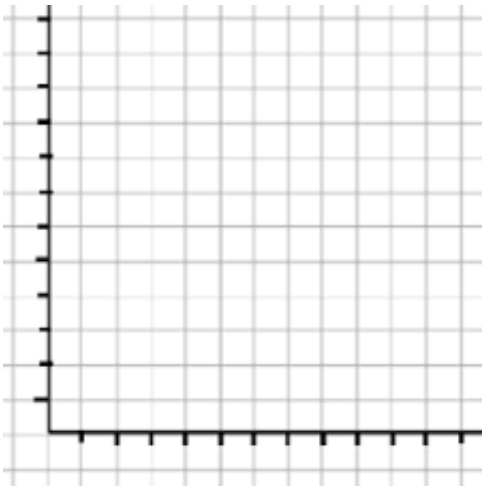


a)	What is the equation formed by the table?	b)	What is her slope? What does her slope mean?
b)	What is her y-intercept? What does it mean?	c)	What is her x-intercept? What does it mean?
c)	How much money will Lisa have left when she has played 7 games?	d)	How many games did she play if she only has $5.50 left?

12. A plumber charges $75 for a service call plus $80 per hour of service.

a) Fill in the table (with labels). Then graph. LABEL the axis

x		y
0		
1		
2		
3		
4		
12		
x		



b) What is the equation?

c) What is her slope?

What does her slope mean?

d) What is the y-intercept? What does it mean?

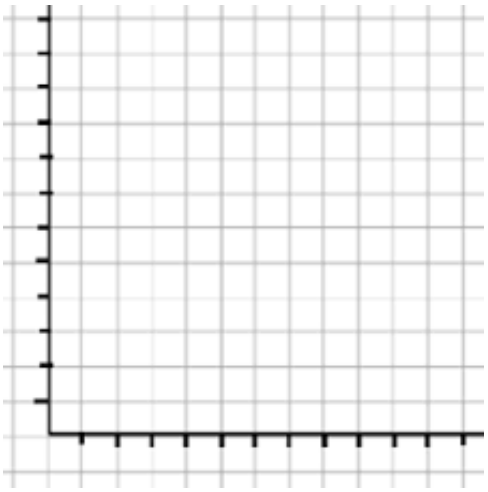
e) If the plumber is there for 3.5 hours, how much will it cost you?

f) Your bill came out to $435, how many hours should the plumber have worked?

13. An attorney charges a fixed fee on $250 for an initial meeting and $150 per hour for all hours worked after that. The bill came out to $3700, how many hours were worked? Then, find the charge for 80 hours of work.

a) Fill in the table. Then graph. LABEL the axis

x		y
0		
1		
2		
3		
4		
12		
x		



b) What is the equation?

c) What is her slope?

What does her slope mean?

d) What is the y-intercept? What does it mean?

e) The bill came out to $3700, how many hours were worked?

f) Find the charge for 80 hours of work.