Meanings of Slope and Intercepts

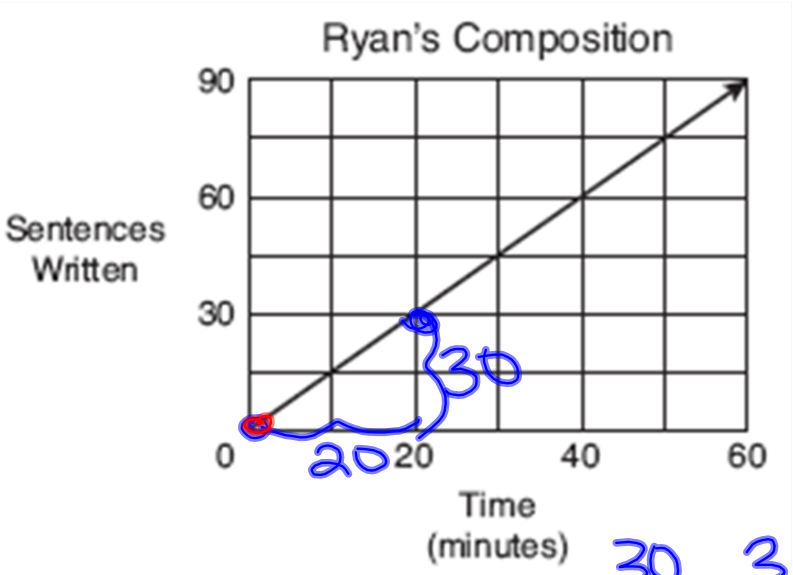
Objective: You will write the real world meanings of slopes and intercepts.

Test Monday!!!

Agenda: warm-up >>> HW check >>> notes >>> homework

warm-up

Ryan is writing a composition for homework. He decides to keep track of the number of sentences he writes compared to the time, in minutes, he works. The graph shows the data he collected.



1. At what rate does Ryan write his composition? m(slope) $m = \frac{30}{20} = \frac{3}{2}$ 3 sentences every 2 min
2. What is the y-intercept? (0,0)

Last night's hw:

1. B
2. C
3. A
4. C
5. D
6. A
7. C

8. The line is steeper and is translated up 6 units.

9.
TRUE
FALSE
FALSE
FALSE
FALSE

Algebra I - Unit 3: Topic 2 – Changes of m & b

Practice – Changes in m & b pp 357-360

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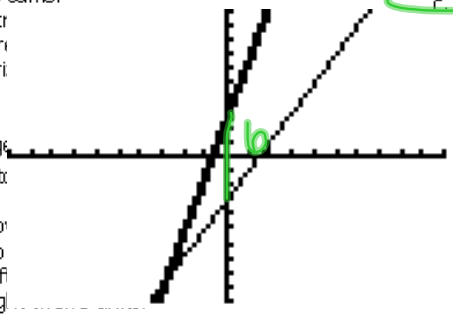
1. Describe the change of the graph of $y = x$ if the equation changes to $y = \frac{1}{2}x + 9$.

a. The new line is steeper and shifts up nine.
b. The new line is less steep and shifts up nine.
c. The new line is less steep and shifts down nine.
d. The new line is steeper and shifts down nine.

2. Describe the change of the graph of $y = x$ if the equation changes to $y = 2x$.

a. The new line is the same.
b. The new line is decr
c. The new line is incr
d. The new line is hori

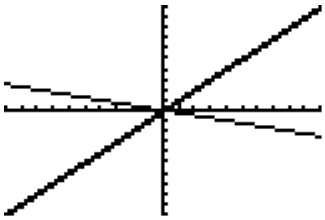


3. Describe the change
intercept changes t

a. The graph shifts do
b. The graph shifts up
c. The graph shifts lef
d. The graph shifts rig

4. Without using a calculator, describe the change of the graph of $y = x$ if the equation changes to $y = -\frac{1}{4}x$.

a. The graph is increasing but is flatter.
b. The graph is increasing and steeper.
c. The graph is decreasing and flatter.
d. The graph is decreasing and steeper.



5. What would be the equation of the line if the $y = x$ is translated 4 units down?

a. y = 4x
b. y = -4x
c. y = x + 4
d. y = x – 4

6. What would be the equation of the line if the line $y = x$ is translated 6 units up?

a. y = x + 6
b. y = x – 6
c. y = -6x
d. y = 6

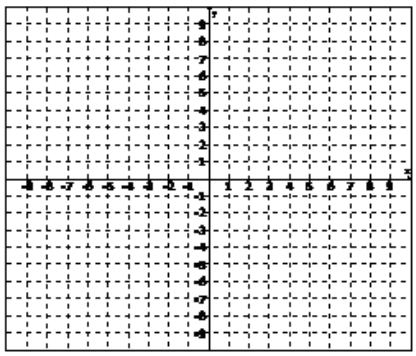
7. What would be the equation of the line if the line $y = x$ becomes two times steeper?

a. y = x + 2
b. y = x – 2
c. y = 2x
d. $y = \frac{1}{2}x$

Without using a calculator, describe the change of the graph of $y = 2x - 3$ if the equation changes to $y = 4x + 3$.

steeper
up 6

9. Given the two linear equations, decide if each statement is TRUE or FALSE.



_____ y_1 and y_2 are parallel.

_____ y_1 and y_2 are perpendicular.

_____ y_1 is steeper than y_2.

_____ y_2 is 4 units above y_1.

_____ y_1 is 4 units above y_2.

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Come and Go Car Rental charges a base rate of $25 dollars and $0.20 a mile. Write a function to express the relationship between the number of miles driven, *m*, and the total cost of renting a car, *c*. ind / dep m c

1. Write an equation that represents this problem situation? $c = .20m + 25$

2. State a reasonable domain and range for your function and situation:

	Function	Situation
Domain	$\mathbb{R}$	$0 \le m \le 200$
Range	$\mathbb{R}$	$25 \le c \le 65$

Linear

3. What is the slope of this line? .20. What does the slope represent in this situation?

charge per mile

4. What is the y-intercept of this line? $25. What does the y-intercept represent in this situation?

base rate

5. Come and Go Car Rental changes their base rate to $35. What does this change about the relationship in the problem?

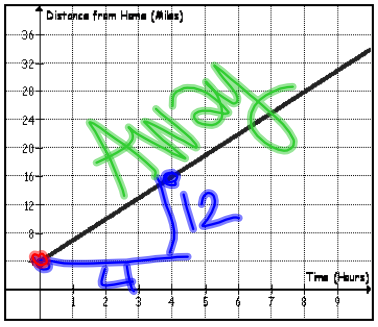
$c = .20m + 25$

$c = .20m + 35$

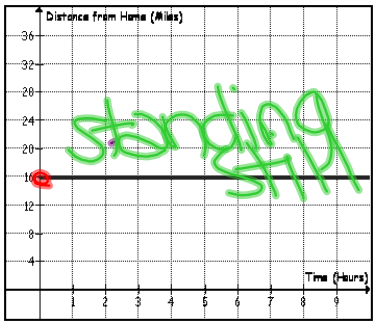
translates up (y-int.)

The graphs below represent the distance traveled by three different people. Use these graphs to answer questions 6-8.

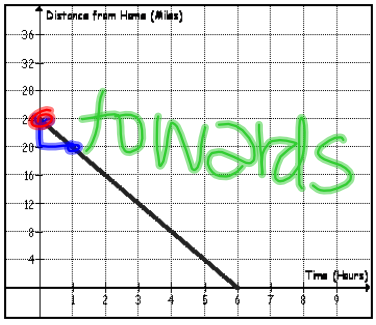
Donna



Jeff



Paula



6. What is the rate at which each person is traveling?

D: $\frac{12}{4}$ = 3mph J: 0mph P: $\frac{-4}{1}$ mph

7. Which person is traveling the fastest and how do you know?

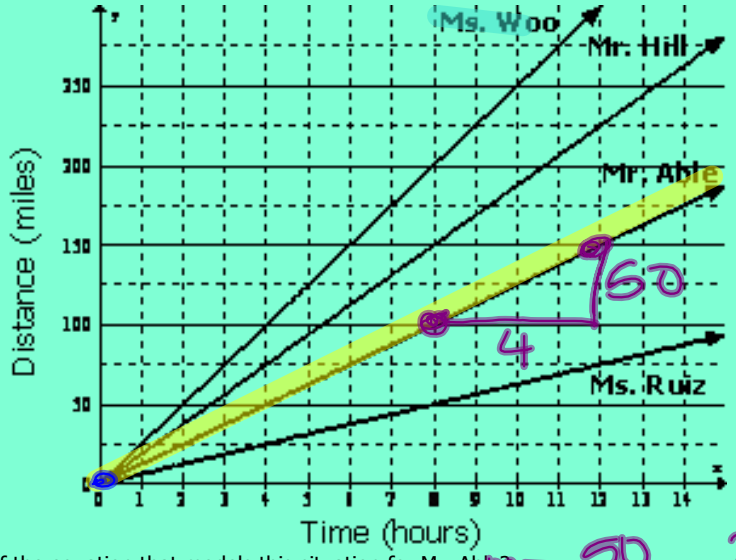
Paula, steepest

8. What does the y-intercept in each graph represent?

starting distance from home

Use the situation below to answer questions 9-12.

Some employees of Ace Corporation left their office building and drove separately on the same roa to a convention. The graph shows the distance traveled by each employee after 5 hours of nonstop driving at 4 different speeds.



9. What is the slope of the equation that models this situation for Mr. Able? $m = \frac{50}{4} = \frac{25}{2}$

10. What is the meaning of this slope?

25 miles traveled every 2 hours

11. What is the y-intercept of the equation that models this situation?

(0,0)

12. What is the meaning of this y-intercept?

start distance

Use the situation below to answer questions 13-16.
Fisherman in the Finger Lakes Region have been recording the dead fish they encounter while fishing in the region. The Department of Environmental Conservation monitors the pollution index for the Finger Lakes Region. The model for the number of fish deaths, y, for a given pollution index, x, is $y = 9.067x + 111.958$

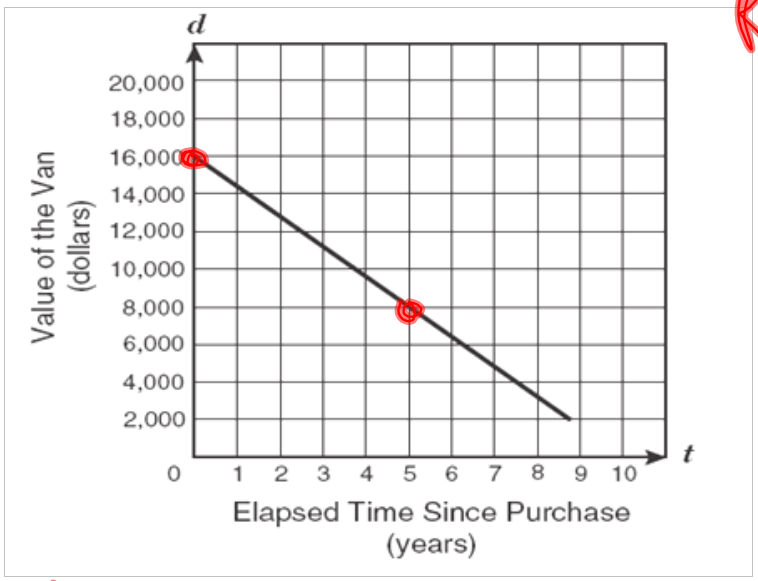
13. What is the slope of the equation that models this situation?

14. What is the meaning of this slope?

15. What is the y-intercept of the equation that models this situation?

16. What is the meaning of this y-intercept?

17. A small business purchased a van to handle its delivery orders. The graph below shows the value of this van over a period of time. Which of the following best describes this situation?



A The van was purchased for $1,600.
B The van decreases in value by $1,600 per year.
C The van increases in value by $1,600 per year.
D The van has no value after 5 years.

Summary

y-intercept means...

- initial value
- starting point
- flat fee

Slope means...

- Rate of change

* PER

Algebra I – Unit 3: Topic 2

Practice - Meaning of Slope and Intercepts — No Textbook Correlation

Name _____ Date _____ Period _____

Using the situation below, answer questions 1-9.

STARZ Car Rentals charges an initial rental fee of $30 plus $0.50 per mile. STRIPES Car Rentals charges a flat fee of $45 plus $0.20 per mile.

1. Write a function rule for the cost of renting a car through STARZ. _____

2. Write a function rule for the cost of renting a car through STRIPES. _____

3. Graph the two functions on the graph provided below. Make sure to label the graphs.

4. What does the *y*-intercept represent in the two equations? _____

5. What does the slope represent in the two equations? _____

6. How long would you have to drive so that the cost would be the same? _____

7. If you were only driving 90 miles, which car rental should you use? _____

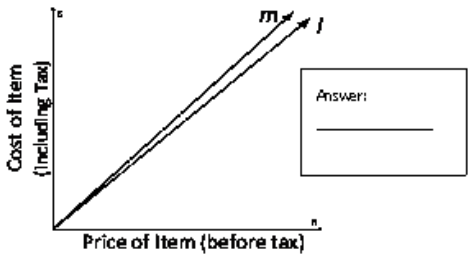
8. Jeri installs granite counter tops. She charges $400 for all jobs and then $80 per linear foot of granite.
   A. What is the equation of the line?

   B. What is the *y*-intercept of the graph? What does it represent?

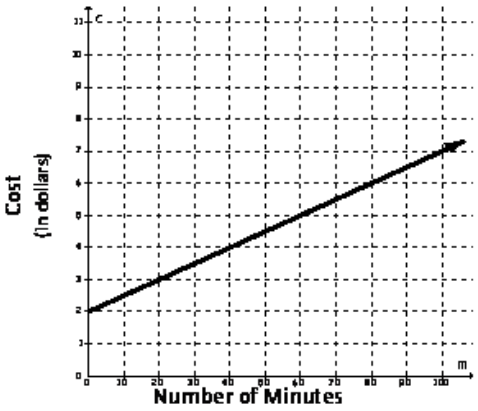
   C. What is the value of the slope? What does it represent?

Algebra I – Unit 3: Topic 2

9. The graphs below show Lines *l* and *m*, the total cost, including tax, of an item in two different states. Which line represents the total cost, including tax, of an item with a higher tax rate?



10. The graph below represents the cost of a long distance call with a phone company based on the number of minutes.



Based on the graph, what is the slope and what does it represent?

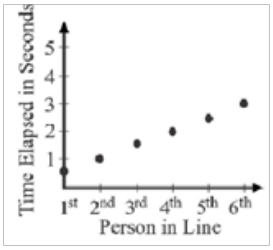
11. Alyssa's carpet cleaning service charges an initial fee of $45, plus $5 for every 100 square feet of carpet cleaned. Alyssa graphed *y*, the amount that her cleaning service charges, as a function of *x*, every 100 square feet of carpet cleaned. What does the *y*-intercept of Alyssa's graph represent?

A The charge per square foot of carpet cleaned
B The number of square feet of carpet cleaned
C The total amount owed
D The initial fee

12. The graph below represents the amount of money Liz borrowed from her father and the number of monthly payments needed to pay it back.

A. What does the slope of the graph represent in the situation?

B. What does the *y*-intercept in the graph represent in this situation?

C. What is the function rule?

13. Ten students are standing in a line in the front of the classroom. The teacher has told them to hold hands with the person on either side of them. When she says "go", the first person squeezes the hand of the person on their right. As soon as that person feels the squeeze, they squeeze the hand of the person on their right, etc. The graph below represents the time at which each of the first six students squeezes the hand of the person on their right. Why is the *y*-intercept not 0?