

MEANINGS OF SLOPE and INTERCEPTS

ESSENTIAL QUESTION: HOW DO I INTERPRET THE MEANING OF THE SLOPE & Y-INTERCEPT OF A REAL WORLD PROBLEM?

QUIZ TMR!!!

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?

Every 2 min, he writes 3 sentences.

2. What is the y-intercept?

(0, 0) starts w/ zero sentences

$$m = \frac{30}{20} = \frac{3}{2}$$

Sentences
↓
minutes ↑

Algebra I - Unit 3: Topic 2

Practice - Slope-Intercept Form

pp 334-337

Name _____ Date _____ Per _____

Write the equation (function rule) that describes each line in slope-intercept form.

1. Slope = $\frac{1}{3}$ and y-intercept: -3

2. y-intercept: 2 and $m: 8$

3. Slope = 0.5 and y-intercept: 3.5

4. $b = -3$ and slope = 0

5. $m = 5$ and y-intercept: 0

6. Slope = $\frac{1}{4}$ and y-intercept: 7

7. $m = -2$ and $b = 2$

8. $b = 6$ and $m = \frac{-4}{5}$

Solve the following for y then identify the slope and the y-intercept

9. $-3y = 9x - 6$

10. $\frac{-1}{2}x + y = 6$

 m (slope) =
 b (y-intercept) =

11. $4x - y = -5$

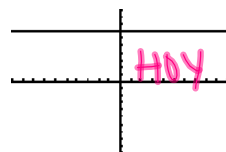
 m (slope) = 4
 b (y-intercept) = 5 m (slope) =
 b (y-intercept) =

12. $2x - 3y = 12$

 m (slope) = $\frac{2}{3}$
 b (y-intercept) = -4

13. What is the slope of the function $-6x - 2y = 8$?

14. What is the rate of change of the function $y = 7$?



slope

$y = mx + b$

$y = 0x + 7$

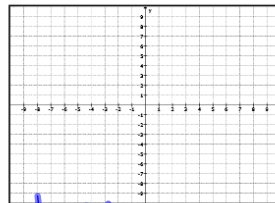
Algebra 1- Unit 3: Topic 2 - Graphing Using m & b Practice - Graphing Using m and b

pp 334-340

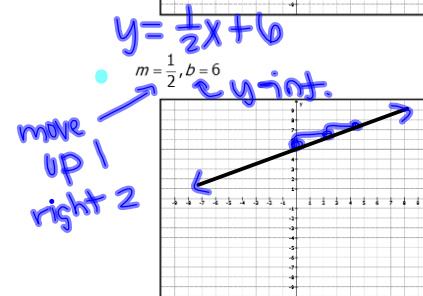
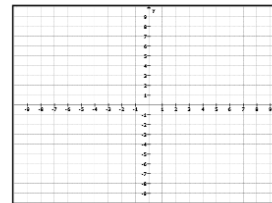
Name _____ Date _____ Period _____

Graph the following using the given characteristics.

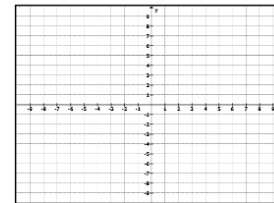
★ $m = -\frac{1}{2}, b = -1$



2. $m = \frac{2}{3}, y$ -intercept = -1

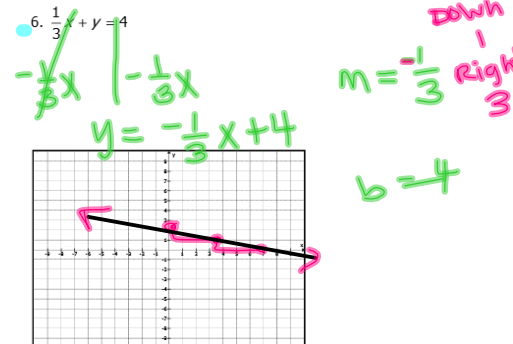
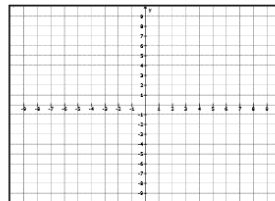


★ rate of change is $-5, b = -3$



For problems 5-8, write each equation into slope-intercept form. Then graph the line described by the equation.

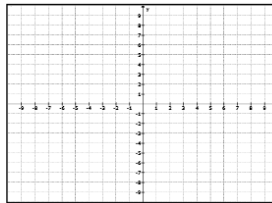
★ $-3x + 4y = -16$



Algebra 1- Unit 3: Topic 2 - Graphing Using m & b

7. $-x - y = -9$

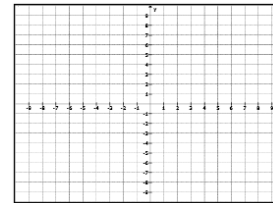
$m = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}}$



8. $4x - 3y = 15$

$$\begin{array}{r} -4x \quad -4x \\ \hline -3y = -4x + 15 \\ \hline \frac{-3y}{-3} = \frac{-4x + 15}{-3} \end{array} \quad y = \frac{4}{3}x - 5$$

$m = \underline{\frac{4}{3}} \quad b = \underline{-5}$

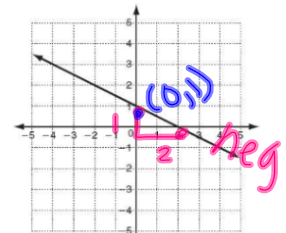


For problems 9 and 10, given the graph, find the slope and the y -intercept and write the equation of the line.

9. $m = \underline{-\frac{1}{2}} \quad b = \underline{1}$

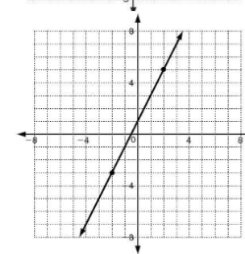
$$\boxed{y = -\frac{1}{2}x + 1}$$

$$y = mx + b$$



$$\star \quad m = \underline{\hspace{2cm}} \quad b = \underline{\hspace{2cm}}$$

$y = \underline{\hspace{2cm}}$



ESSENTIAL QUESTION: HOW DO I INTERPRET THE MEANING OF THE SLOPE & Y-INTERCEPT OF A REAL WORLD PROBLEM?

c input

output

- $$C = 25 + 0.20 \text{ m}$$

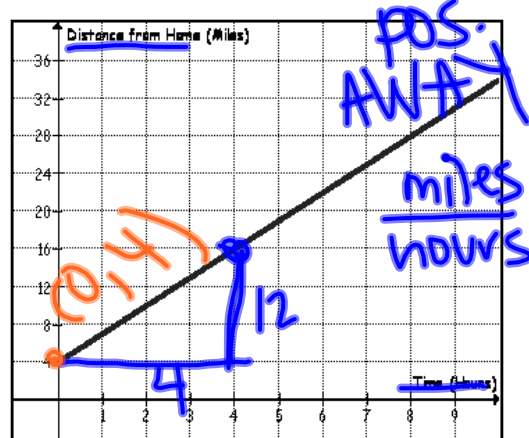


$$y = \underline{m}x + \underline{b}$$

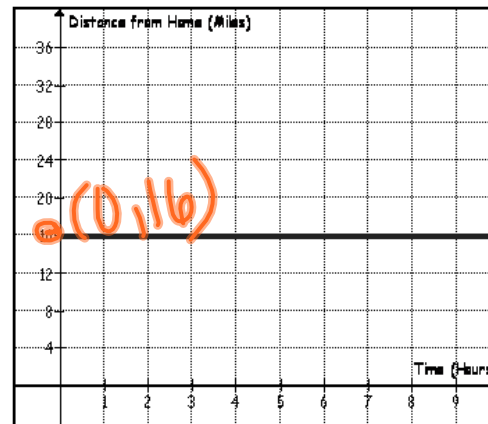
3. What is the slope of this line? 0.20. What does the slope represent in this situation?
charge per mile
4. What is the y-intercept of this line? 25. What does the y-intercept represent in this situation?
base rate for car rental
5. Come and Go Car Rental changes their base rate to \$35. What does this change about the relationship in the problem?
y-intercept increases

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

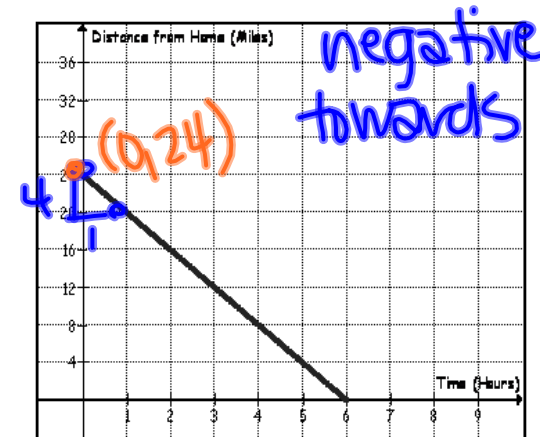
Donna



Jeff



Amber



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

Handwritten calculations for rate (slope):

- Donna: $\frac{12}{4} = 3 \text{ mph}$ (Note: slope is 3, not 12/4)
- Jeff: 0 mph
- Amber: $\frac{4}{1} = 4 \text{ mph}$ (Note: slope is -4, not 4/1)

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

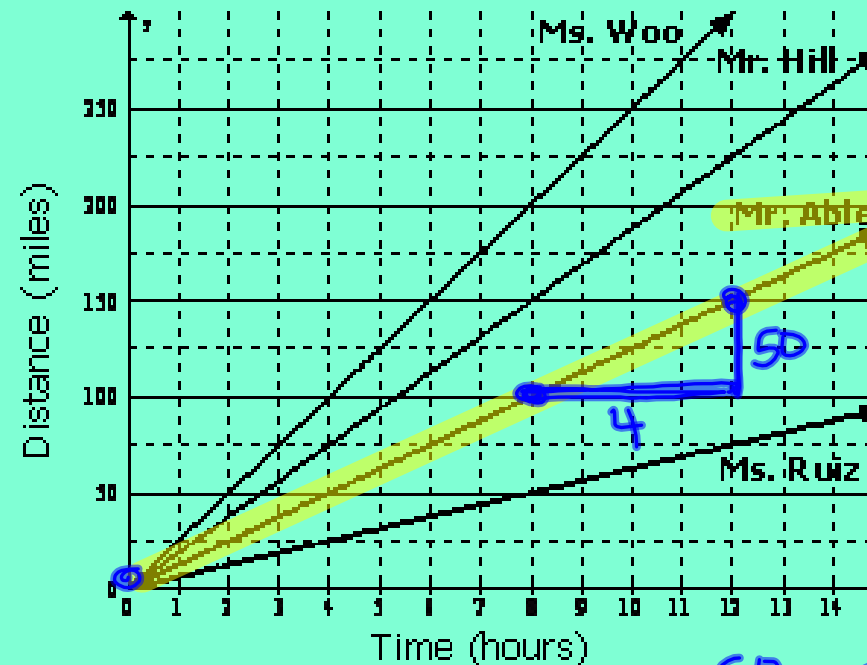
Handwritten answer: Amber, $4 > 3$ or slope steeper

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

Handwritten answer: 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 road 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?

$$m = \frac{50}{4} = \frac{25}{2}$$

← miles
← hours

10. What is the meaning of this slope?

EVERY 2 hours, he drove 25 miles.

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

(0,0)

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

starting point (started @ office)

Use the situation below to answer questions 13-16.

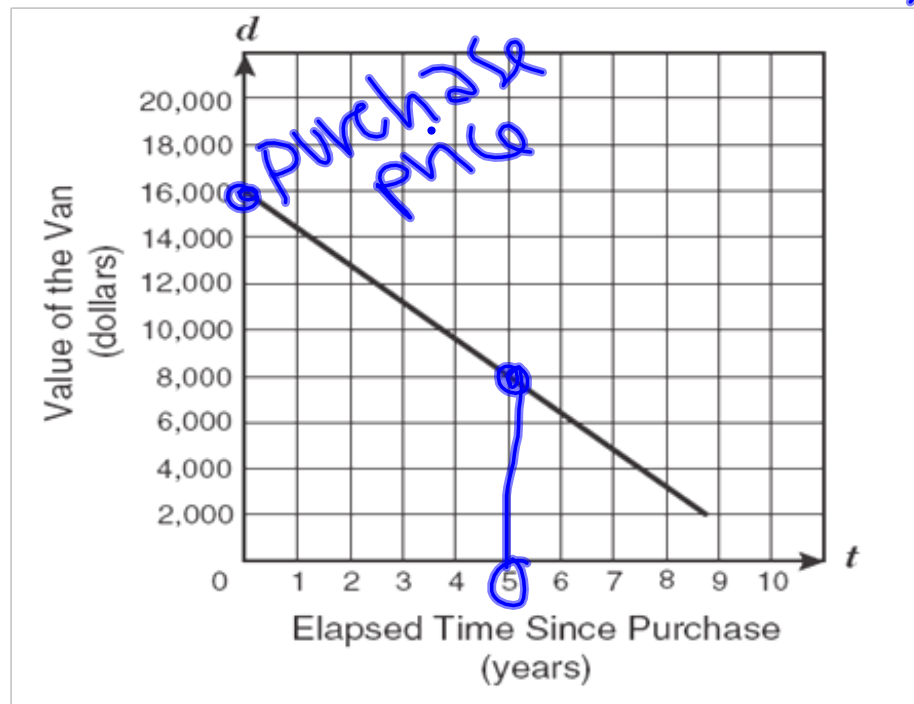
Fisherman in the Finger Lakes Region have been recording the dead fish they encounter while fishing in the region. The Department of Environmental Conservation monitors the pollution index for the Finger Lakes Region. The model for the number of fish deaths, y , for a given pollution index, x , is $y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

↑ slope ↑ y-int.



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~~
- B
- ~~C~~
- ~~D~~

The van was purchased for \$1,600.

The van decreases in value by \$1,600 per year.

The van increases in value by \$1,600 per year.

The van has no value after 5 years.

summary

SLOPE — rate of change

PER

ex. speed, cost per item

y-intercept — beginning value

- starting point
- initial
- base rate / flat fee

QUIZ REVIEW

over ALL OF UNIT 3 SO FAR! ESPECIALLY FOCUS
on INTERCEPTS, SOLVING FOR y, and SOLUTIONS
you may use your notebook.

1. Find the domain for the equation $3x+2y = -4$ if the range is $\{7, -2\}$.
2. Know the slopes of horizontal and vertical lines.
3. What is the x-coordinate of a y-intercept?
4. Find the slope between $(0,4)$ and $(-3, 6)$
5. What do the m & b stand for in slope-intercept form?

Algebra I – Unit 3: Topic 2

Practice - Meaning of Slope and Intercepts

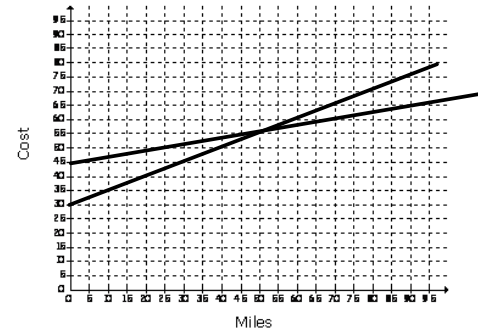
No Textbook Correlation

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.

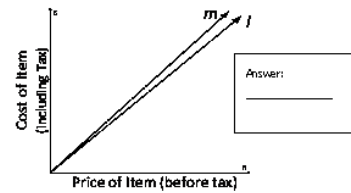
- Write a function rule for the cost of renting a car through STARZ. _____
- Write a function rule for the cost of renting a car through STRIPES. _____
- Graph the two functions on the graph provided below. Make sure to label the graphs.



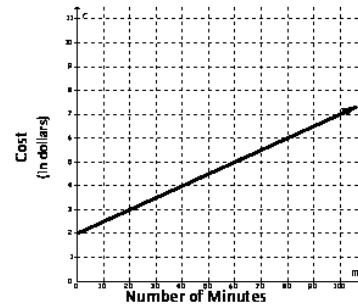
- What does the y -intercept represent in the two equations? _____
- What does the slope represent in the two equations? _____
- How long would you have to drive so that the cost would be the same? _____
- If you were only driving 90 miles, which car rental should you use? _____
- Jeri installs granite counter tops. She charges \$400 for all jobs and then \$80 per linear foot of granite.
 - What is the equation of the line?
 - What is the y -intercept of the graph? What does it represent?
 - What is the value of the slope? What does it represent?

Algebra I – Unit 3: Topic 2

9. The graphs below show Lines j 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?



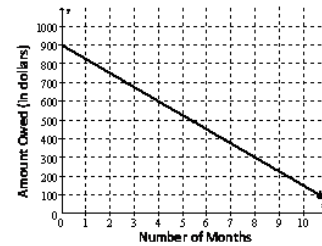
10. The graph below represents the cost of a long distance call with a phone company based on the number of minutes.



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?
- The charge per square foot of carpet cleaned
 - The number of square feet of carpet cleaned
 - The total amount owed
 - 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.



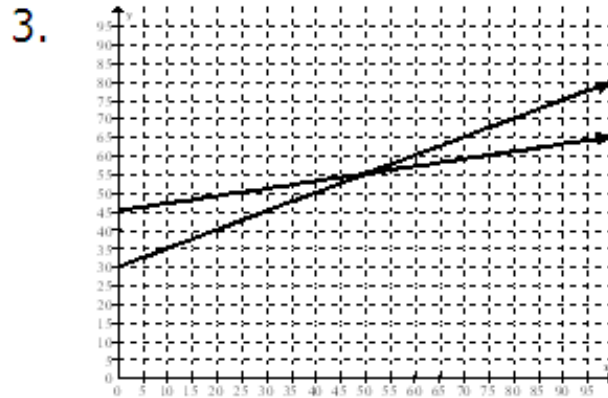
- What does the slope of the graph represent in the situation?
- What does the y -intercept in the graph represent in this situation?
- What is the function rule?

HW CHECK: MEANINGS OF SLOPE AND INTERCEPTS

Answers:

1. $y = 30 + 0.5x$

2. $y = 45 + 0.20x$



4. The initial rental fee

5. The cost per mile

6. 50 miles

7. STRIPES

8. A. $y = 400 + 80x$

B. \$400 initial fee

C. \$80 per linear foot

9. line m

10. $m = \frac{1}{20}$ or $m = \frac{0.05}{1}$

cost per minute

11. D

12. A. The amount owed each month

B. The original amount borrowed

C. $y = -75x + 900$

QUIZ TOMORROW!

