

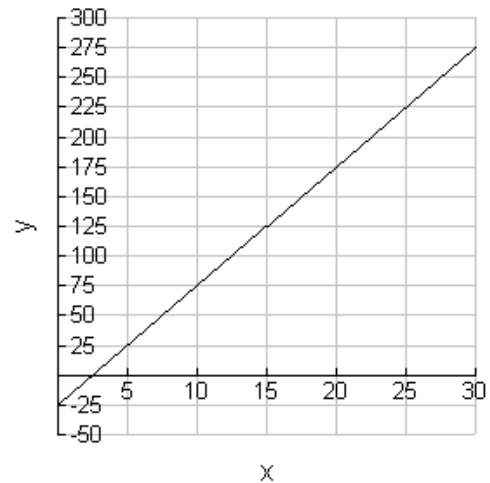
Sample Questions for Math 60 SLO “*At the conclusion of Math 60, students will be able to create, analyze, and interpret linear models of real world applications.*”

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**Sample 1:**

This graph shows how Citibank de Mexico exchanges dollars into pesos on the day that Crystal goes to the bank, where  $x$  = U.S. dollars,  $y$  = Mexican pesos

- Does Citibank de Mexico charge a fee for exchanging money? How do you know? If so, how much?
- Crystal looks at the graph and sees that she will get 75 pesos for 10 U.S. dollars. So she says the exchange rate at this bank must be  $7\frac{1}{2}$  pesos per dollar. Do you agree or disagree? Explain.



- Find an equation that models this situation. Clearly define your variables. Explain how you determined your equation.
- Explain how the constants (the numbers that are not changing) in your equation relate to the graph.
- Crystal wants to figure out how many pesos she will get at Citibank de Mexico if she exchanges \$50. She sees that she will get 225 pesos for \$25, so she thinks that she will get 450 pesos for \$50. Explain why Crystal’s thinking is logical and explain WHY her process doesn’t work in this situation.
- How many pesos will she get for \$50? How do you know?

**Sample 2:**

**Mr. Hugen decided to go on a diet because he was considerably overweight. He kept track of the number of pounds he had left to lose at the end of every week and recorded them. The following table gives two of his entries.**

<b>Week (<math>x</math>)</b>	<b>4</b>	<b>12</b>
<b>Pounds (<math>y</math>)</b>	<b>120</b>	<b>80</b>

- a.** Plot these two pieces of information as points on the graph given below and draw a line between them.

Pounds

- b.** Find the slope of the line through these points. What are the units of measure? What is the meaning of the slope in this situation?

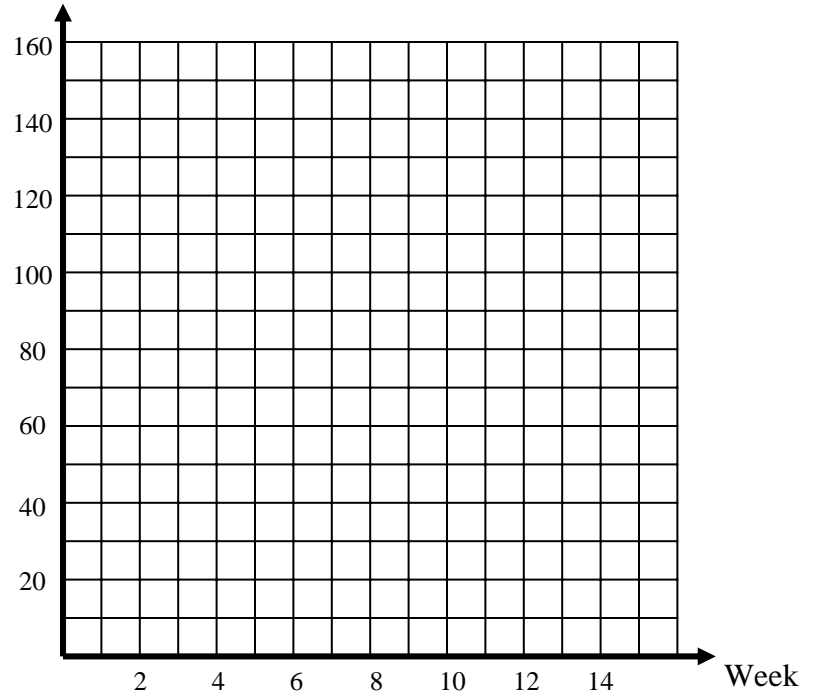
- c.** Find the equation of the line.

- d.** Find the  $y$ -intercept of the line. What is its practical meaning in this problem?

- e.** Find the  $x$ -intercept of your line. What is its practical meaning in this problem?

- f.** At the current rate how many weeks will it take for Mr. Hugen to get to the point where he only has 10 pounds left to lose?

- g.** How many pounds does Mr. Hugen have left to lose after 18 weeks?

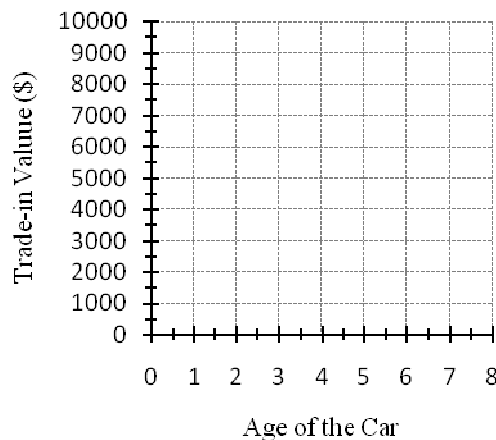


**Sample 3:**

Suppose you own a car that is presently two years old and the “Kelly Blue Book” trade-in value is \$6270. In an old Blue Book you found that the trade-in value of your car one year ago was \$7800. This data can be written in table format, where the input represents the age of the car in years and the output represents the trade-in value. Assume that the value of your car decreases linearly with time.

Age of the Car in Years, $x$	Trade-in Value in dollars, $y$
2	\$6270
1	\$7800

- (a) Plot the two points on the grid below and sketch the line containing them. Extend the line so that it intersects the vertical axis.

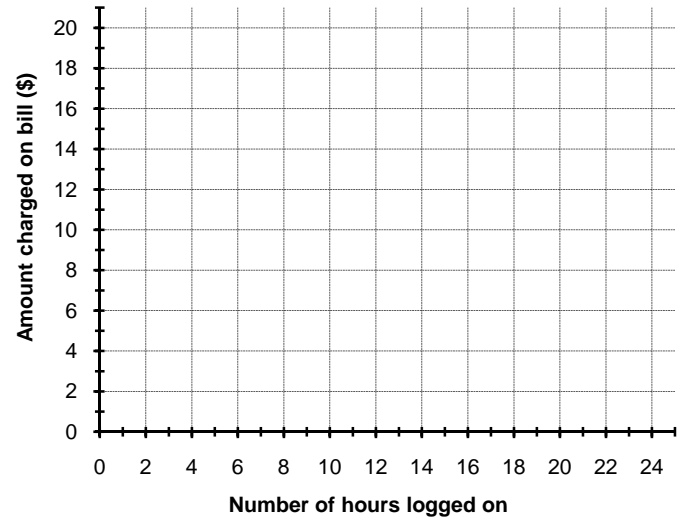


- (b) Determine the slope of the line. What are its units of measurement? What is the practical meaning of the slope in this situation?
- (c) Write an equation for the line containing the two points you graphed.
- (d) What is the vertical intercept of the line you graphed and whose equation you wrote? What is the practical meaning of the vertical intercept in this situation?
- (e) Use this model to predict the price of your car after 5 years.
- (f) Use this model to determine the year that the price of your car was \$3180.

### Sample 4

Doreen subscribes to an Internet service. On her first bill she was charged \$16.20 for 18 hours logged on. On her second bill she was charged \$17.75 for 23 hours of service. Assuming a linear relationship, answer the following questions.

- (a) Write this information as two ordered pairs or in a table if you prefer with number of hours logged on as the input (independent variable) and the amount charged as the output (dependent variable).



- (b) Graph the two points. Use a straightedge to draw the line containing your two points.
- (c) Find the slope of the line containing the two points you graphed.

What does the slope mean in relation to Doreen's Internet service? Use numbers as part of your explanation.

- (d) Write an equation for the line containing the two points you graphed.
- (e) What is the vertical intercept ( $y$ -intercept) of the line you graphed and whose equation you wrote?

What does the vertical intercept ( $y$ -intercept) mean for Doreen?

- (f) If Doreen uses the Internet for 32 hours next month, what can she expect her bill to be?
- (g) Doreen received a bill for \$89.36. How many hours did she use the Internet that month? Show or explain how you determined your answer.