

Project I – Linear Functions

Your Name: _____

Other Members Names: _____

1. An airplane cruising at an altitude of 5000 meters begins to descend at a constant rate of 250 meters per minute.
 - a) Build a table and graph to show the altitude, A , of the airplane as a function of m , the number of minutes it has been descending. Be sure to LABEL your graph correctly and completely.

TABLE

m, # of minutes	A, altitude (m)
0	
5	
10	
15	
20	

GRAPH



- b) Why did I only give you the first quadrant of the coordinate axes with which to show your graph?
 - c) State each intercept of your graph. (Be sure to state which is which.) Then interpret the practical meaning of each.
 - d) State and interpret the practical meaning of the slope of your line.
 - e) Give a point-slope equation for this line.

2. A submarine, cruising 160 meters beneath the surface of the ocean, begins to rise toward the surface at a rate of 12 meters per second.
- The height of the submarine above the ocean surface, h , is a function of time, t . Write this fact using function notation.
 - Based solely on the statement of this situation, how do you know that this function is linear?
 - Write the slope-intercept form of the equation which models this real-life situation.
 - WITHOUT USING A GRAPH, find the horizontal and vertical intercepts of your function, and interpret the real-life meaning of each.
 - Sketch a graph of this function. Again, be sure to label your axes correctly and completely. (Also, be sure to think about what quadrants “make sense” in the context of this real-life problem.)

3. A person in New Hampshire had invited friends over to watch the Maryland-Indiana NCAA Championship Game. She had \$24 to spend on soda and chips for the get-together. Suppose a six-pack of soda costs \$4 and a bag of chips cost \$2. The number of six-packs she can afford, S , is a function of the number of bags of chips, C , she buys. (NOTE: There is no sales tax on the purchase of food items in the state of New Hampshire.)
- a) If she purchases six bags of chips, how many six-packs can she afford?
- b) If she purchases five bags of chips, how many six-packs can she afford?
- c) Find a formula relating C and S .
- d) State and interpret the practical meaning of the slope of both intercepts of the function found in part (a).

4. A tour boat operator found that when the price charged for a scenic boat tour was \$25, then 500 customers were willing to pay. When the price was reduced to \$20, the number of customers went up to 650.
- a) If the number of customers, C , is a linear function of the price, p , write a formula for $C = f(p)$.
- b) Find and interpret the meanings of the slope and both intercepts of the function found in part (a).
- c) Sketch a graph of this function based on the real-life scenario.