Math 107

HW #4 - Linear

Do these problems on Excel or by hand

1. The price of a particular model of car is $18000 today and rises with time at a constant rate of $900 per year.
   a) Write a linear equation that gives the price as a function of x where x is the number of years from today
   b) Write a recursive model for this equation
   c) How much will the car cost in 4.5 years? When will the car double in price? Do you believe this result or are you skeptical?
2. A snow plow has a maximum speed of 40 miles per hour on a dry highway. Its maximum speed decreases by 1.1 miles per hour for every inch of snow on the highway.
   a) Write a linear equation that gives the maximum speed of the snowplow as a function of the depth of the snow on the road
   b) Write a recursive model for this equation
   c) At what snow depth will the plow be unable to move according to this model
3. A new $1200 washing machine in a laundromat is depreciated for tax purposes at a rate of $75 per year.
   a) Write a linear equation that gives the value of the washing machine x years after it is bought
   b) Write a recursive model for this situation
   c) When does the depreciated value equal $0
4. Suppose you dog weighed 2.5 pounds at birth and weighed 15 pounds 1 year later. Based on these two data points, find a linear function that describes how weight varies with age. What will the weight of your dog be at 5 years and at 10 years according to the model. Comment on whether you think the model is valid
5. A small store sells fresh pineapples. Based on data for the pineapple prices between $2 and $5, the storeowners created a model in which a linear function is used to describe how the demand (number of pineapples sold per day) varies with the price. For example At a price of $2 , then 80 pineapples will be sold. While at a price of $5, only 50 pineapples will be sold. Create a linear equation that gives the number of pineapples sold for a given price. At what price will there be no demand for pineapples

DATA PROBLEMS – DO on EXCEL

6. According to college guide, a graduate with a degree in economics can expect to earn about $35000 per year after 2 years on the job with an annual increase of $3000 each year in salary. Using this information – create a chart using two columns – first column is years after graduation and second column is salary. Start the first column from year 0. Once you have the chart draw a nice graph and include appropriate labels

7. In 1970 there were 800 trout in a lake. In 1978, there were 1600 trout. If this example represented linear growth, Create a chart with the first column being years since 1970 and the second being trout in the lake. Start he year column at 0 and carry down to 2002. Draw a nice graph of this situation. And include appropriate labels

8.

Year	Number of Collisions (thousands)
1992	4.9
1995	4.6
2000	3.5
2005	3.1
2010	2.1
2014	2.3

a) Draw a scatterplot or use Excel

b) Draw a trendline and write the equation of the line on your graph.

c) Use your model to predict how many collisions occurred in 2012. Did you perform interpolation or extrapolation?

d) Use your model to predict when there will be 1.0 thousand collisions. Does this make sense?

e) Find the horizontal intercept. What does it mean in the context of this problem? Does it make sense?