MATH 2830 - Sec 002 Introductory Statistics
Practice problems for exam #2

We will discuss these in class on Monday 10/11. You should work on all the problems in order to see if there are any gaps in your understanding. The exam will include matching problems and other questions that are less challanging than these, so if you can solve these problems you are in good shape!

1. At the video store, 20% of the customers rent 1 dvd, 40% rent 2 dvd's, 20% rent 3 dvd's, 10% rent 4 dvd's, and 10% rent more than 4.
   (a) What is the probability a customer rents 1 or 2 dvd's?
   (b) What is the probability a customer rents more than 3 dvd's?
   (c) What is the probability a customer rents more than 4 dvd's given she rents more than 3 dvd's?
   (d) Can you determine the mode and median of the number of dvd's a customer rents? If so, what are they?
   (e) Can you determine the mean and variance of the number of dvd's a customer rents? If so, what are they?
2. Suppose 30% of the vehicles on a road are trucks, and the rest are cars. Suppose there are 125 vehicles stopped in a trafic jam.
   (a) What is the probability that there are exactly 90 cars?
   (b) What is the probability there are between 90 and 99 cars in the jam? (including 90 and 99)
   (c) What is the probability there are less than 100 cars in the jam, given there are more than 90 cars in the jam?
   (d) What is the expected value and standard deviation of the number of cars in the jam?
3. The prices of houses in a neighborhood are Normally distributed with $\mu = 200$ and $\sigma = 20$ (in thousands of dollars).
   (a) What fraction of the houses cost less than \$200?

(b) What fraction of the houses cost between \$190 and \$215?

(c) What fraction cost between \$150 and \$180?

(d) What fraction cost between \$220 and \$250?

(e) What is the probability that a house costs more than \$180 given that it costs less than \$200?

(f) What is the probability that a house costs less than \$210 given that it costs more than \$190?

(g) What is the price so that 75% of the houses are cheaper? (i.e. the 75th percentile)

(h) What is the median and mode of the prices?