Practice Exam Math 150

1. True or False (Just answer true or false, you don't need to explain your answer):

   - The average height of the male population of the world is a statistic.
   - An AOL poll asking "How often do you use credit cards for purchases?" was answered by 4230 respondents who decided to responce. Among them, 67% answered "frequently". This is an example of a voluntary response sample.
   - The difference between a simple random sample and a random sample is that the simple random sample places the extra restriction that any sample of n subjects is equally likely.
   - A random sample of n subjects is a sample where each member of the population had the same chance of being selected.
   - If you construct a sample by selecting every third member of a population, the result is a voluntary response sample.
   - Voluntary response samples are untrustworthy.
   - The sample standard deviation is the square root of the sample variance.
   - Midrange, median and mean are the only measurements of center.
   - Range, variance and standard deviation are measurements of center.
   - Consider a data set with mean μ and standard deviation σ. Chebyshev's theorem states that for any real number $k > 0$ the proportion of values in the data set that are in the interval $(\mu - \sigma, \mu + \sigma)$ is at least $(1 - 1/k^2)$.

2. The following data set consists of the volumes of the brains of 20 males in cm^3:

1005	963	1035	1027	1281	1272	1051	1079	1034	1070
1173	1079	1067	1104	1347	1439	1029	1100	1204	1160

   - Construct a frequency distribution of the data set using the classes $900-999, 1000-1099$ and so on.
   - Construct the histogram that corresponds to that frequency distribution.
   - Applying a very strict interpretation of the requirements for a normal distribution, does the histogram suggest that the data are from a population having a normal distribution? **Why or why not?**

3. Consider the following data set (representing the ages of the last 5 presidents of the United States of America):

47	54	46	64	69

   - What is the median?
   - What is midrange?
   - What is the mode?
   - What is the mean?
   - What is the sample standard deviation?

4. The Southern California Earthquake Data Center recorded magnitudes (Richter scale) of 10594 earthquakes in a recent year. The mean is 1.240 and the standard deviation is 0.578. Consider the magnitudes that are unusual. What are the magnitudes that separate the unusual earthquakes from the usual?

5. Consider the years presidents lived after being elected to office (Data Set 12). Consider just the data for the first 21 presidents.

   - Sort the data.
   - Find the median.
   - Find the third quartile.
   - Find the 20th percentile, i.e., P_{20}.
   - Make a frequency distribution using 4 classes.
   - Compute the mean from the frequency distribution (**Not the mean of the original data, but the mean you get from using the frequency distribution**).

Extra problems to practice

- Section 3.2: 29.
- Section 3.4: 8, 14.
- Other problems similar to the ones listed.