MAT 420/520 – Assignment 1

Complete any five of the following.

1. Let X and Y be the lifetimes of two brands of light bulbs, and suppose that X is N(2000, 40000) and Y is N(2500, 90000). Suppose that we have a 5-pack of each, and let $\bar{X}$ and $\bar{Y}$ be the sample means.

   a.   What are the means and variances of $\bar{X}$ and $\bar{Y}$?

   b.   What is the distribution of $\bar{X} - \bar{Y}$?

   c.   Find $P(\bar{X} > \bar{Y})$.

2. 6.1-10

3. 6.4-2

4. 6.4-10

5. The numbers below represent heights (in feet) of 3-year old elm trees, where leaves represent decimal parts of each value.

Stems	Leaves
5	1, 8
6	1, 2, 4, 7, 8, 9
7	0, 2, 3, 3, 4, 5
8	1, 1, 2, 3, 5, 6, 6, 7, 7, 9, 9
9	0, 1, 3, 4

   a.   Find the five number summary for the given set of data.

   b.   Produce a box and whisker plot for the data.

6. Assuming that the heights of 3-year old elm trees are normally distributed, use the data in the previous problem to find a 90% confidence interval for the mean height of 3-year old elm trees.