Math 3215 Practice Test 4

1a. Let $X_1, X_2, \cdots X_n$ is a random sample of size $n$ from a normal distribution $N(\mu, \sigma^2)$.

Show that $\bar{X} = \frac{\sum_{i=1}^{n} X_i}{n}$ is $N(\mu, \sigma^2/n)$. (Hint Use the moment generating function).

b. Problem 5.1-2

2a. Problem 6-1-8

b. Problem 5.6-3

3a. A random sample with $n = 37$ was taken. The sample characteristics were $\bar{x} = 11.95$ and $s = 11.80$. Find the approximate 95% confidence interval for the mean $\mu$.

b. Let $X$ equal the excess weight of soap in a 1000 gram bottle. Assume that the distribution of $X$ is $N(\mu, 169)$. If a random sample of size 25 is taken and $\bar{x} = 36$. Find a 90% confidence interval for $\mu$.

4. Problem 6.4-3 in the text.