Math 3339 – Spring 2018   Name:

HW #8

Please, write clearly and justify all your steps, to get proper credit for your work.

(1)[4 Pts] In comparing the times until failure (in hours) of two different types of light bulbs, we obtain the sample characteristics $n_1 = 45$, $\bar{x} = 984$, $s_x^2 = 8,742$ and $n_2 = 52$, $\bar{y} = 1,121$, $s_x^2 = 9,411$. Find an approximate 90% confidence interval for the difference of the two population means.

(2)[4 Pts] We need to estimate the average of a population and from measurements on similar populations we estimate that $s^2 = 8$. Find the sample size n such that we are 90 percent confident that the estimate of $\bar{x}$ is within ± 1 unit of the true mean μ.

(3)[4 Pts] Let μ be the mileage of a certain brand of tire. A sample of $n = 24$ tires is taken at random, resulting in $\bar{x} = 32,132$, $s_x^2 = 2,596$. Find a 99 percent confidence interval for μ.

(4)[4 Pts] Two rubber compounds were tested for tensile strength and the following values were found

$$A: \quad 32, 30, 33, 32, 29, 34, 32$$
$$B: \quad 33, 35, 36, 37, 35$$

Find a 95% confidence interval for the difference of the two population means.

(5)[4 Pts] State DMV records indicate that of all vehicles undergoing emissions testing during the previous year, 70% passed on the first try. A random sample of 200 cars tested in a particular county during the current year yields 160 that passed on the initial test. Does this suggest that the true proportion for this county during the current year differs from the previous statewide proportion? Test the relevant hypotheses using $\alpha = 0.05$.