HW #10

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 $n_1 = 45$, $\overline{x} = 984$, $s_x^2 = 8,742$ and $n_2 = 52$, $\overline{y} = 1,121$, $s_x^2 = 9,411$. 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 $\overline{x}$ 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 $\overline{x} = 32,132$, $s_x^2 = 2,596$. 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] One tire manufacturer found that after 5,000 miles, $y = 32$ out of $n = 200$ tires of a certain brand selected at random were defective. Find an approximate 99% confidence interval for p, the proportion of defective tires in the entire population.