Graded Homework Set 5 – Statistics Math 135 (Reference pages shown in red)
(Five problems)

1. Write the null and alternative hypotheses you would use to test each of the following situations using proportions:

a. In the 1950's only about 40% of high school graduates went on to college. Has the percentage changed?

b. 20% of cars of a certain model have needed costly transmission work after being driven between 50000 and 100000 miles. The manufacturer hopes that redesign of a transmission component has solved this problem.

c. We field test a new flavor soft drink, planning to market it only if we are sure that at least 60% of the people like the flavor.

(See page 506)

2. Test the given hypotheses by stating:

1) $\hat{p}$,
2) the standard deviation for the sample proportion
3) the critical value of z
4) the test value of z
5) draw a picture of the situation with a normal probability curve
6) state your conclusion

(See pages 544, 545 and 546)

a. H_o: p = 0.3 n = 200 x = 75 α = 0.05
H_1: p > 0.3

b. H_o: p = 0.4 n = 1000 x = 420 α = 0.01
H_1: p ≠ 0.4

3. A recent study claimed that at least 15% of all 8th graders are overweight. In a sample of 80 students, 9 were found to be overweight. At α = 0.05, is there enough evidence to reject the claim? Show all of your work for credit. Use the following hypotheses:

H_o : p = 0.15
H_1 : p < 0.15

(Use the guidelines in problem 2 above.)

4. A job placement director claims that the average starting salary for nurses is $24000. A sample of 10 nurses has a mean of $23450 and a standard deviation

of $400. Is there enough evidence to reject the director's claim at $\alpha = 0.05$? Conduct a t-test and Use the hypotheses: $H_o: \mu = 24000$ and $H_1: \mu \neq 24000$. Show your work to support your conclusion. No credit given unless work is shown.

(See page 535, 536, and top of page 537, step 5)

5. The average size of a farm in Indiana County, PA is 191 acres. The average size of a farm in Green County, PA is 199 acres. Assume the data were obtained from two samples with standard deviations of 38 acres and 12 acres, respectively, and sample sizes of 8 and 10 respectively. Can it be concluded at $\alpha = 0.05$ that the average size of the farms in the two counties is different? Show your work to support your conclusion. No credit given unless work is shown. (See Example 1 page 590)