When operating normally, a manufacturing process produces tablets for which the mean weight of the active ingredient is 5 grams, and the standard deviation is 0.025 gram. For a random sample of 12 tables the following weights of active ingredient (in grams) were found:

5.01 4.69 5.03 4.98 4.98 4.95 5.00 5.00 5.03 5.01 5.04 4.95

Without assuming that the population variance is known, test the null hypothesis that the population mean weight of active ingredient per tablet is 5 grams. Use a two-sided alternative and a 5% significance level. State any assumptions that you make.

The president of Amalgamated Retailers International, Sam Peterson, has asked for your assistance in studying the market penetration for the company’s new cell phone. You are asked to determine if the market share is equal to the company’s claim of 35%. You obtain a random sample of potential customers from the area. The sample indicates that 258 out of a total sample of 800 indicate they will purchase from Amalgamated

[a] Using a probability of error , test the hypothesis that the market share equals the company’s claim of 35% versus the hypothesis that the market share is not equal to the company’s claim.

[b] Using a probability of error , test the hypothesis that the market share equals the company’s claim of 35% versus the hypothesis that the market share is less than the company’s claim.