

Show all work. Include at least 3 digits in all answers. Include the names of any MINITAB or calculator commands used.

1. (4 points) A survey of 25 people found that 28% would be willing to pay significantly more for a light bulb if it lasted significantly longer. Find a 99% confidence interval for the proportion of people in the general population who would be willing to pay more for longer lasting light bulbs.

2. (6 points) A cell phone manufacturer claims that their phones can last for at least 200 minutes of talk time before the battery needs recharging. A sample of 50 phones is tested for battery life. The tests show an average talk time battery life of 199 minutes with standard deviation of 4 minutes. **(a)** Write the claim and identify the best hypotheses to test. **(b)** Using $\alpha = 0.05$, decide whether or not to reject your null hypothesis. **(c)** Write a sentence summarizing your results.

3. (6 points) Careless Pete speeds regularly while driving. He claims that he averages no more than 44 mph in a 40 mph zone. A police sample of 12 of Pete's trips in a 40 mph zone found that Pete averaged 47 mph with a standard deviation of 10 mph. **(a)** Write the claim and identify the best hypotheses to test. **(b)** Using $\alpha = 0.10$, decide whether or not to reject your null hypothesis. **(c)** Write a sentence summarizing your results.

4. (4 points) Write two sentences describing the events that occur for a Type I and a Type II error using the hypotheses in Problem 2.