## Math 153 - Quiz 10

December 1, 2016

Name \_

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary.

- 1. (5 points) Metal rods are manufactured by a certain machine. From past experience, the population standard deviation of the rod diameters has been found to be  $\sigma = 0.053$  in. Suppose you would like to find a 95% confidence interval estimate for the mean diameter of rods produced by the machine.
  - (a) What size sample should you use to ensure a margin of error of less than 0.015 in?

(b) A random sample of 50 rods gave a mean diameter of 1.42 in. Compute the corresponding 95% confidence interval estimate. Write a complete sentence that gives a valid interpretation of your interval.

(c) What is the margin of error associated with your interval estimate? Does it agree with your result from part (a)?

- 2. (5 points) A tourist agency researcher would like to determine the proportion of U.S. adults who have ever vacationed in Mexico. The researcher would like to construct a 90% confidence interval estimate.
  - (a) What sample size should the researcher use to ensure a margin of error of less than 2%?

(b) The researcher found a poll that suggested that 10.4% of adults have vacationed in Mexcio. Does this information change your sample size? If so, to what?

(c) The researcher selected 1500 U.S. adults at random and found that 8.2% had vacationed in Mexico. Find the corresponding 90% confidence interval estimate for the population proportion. Write a complete sentence that gives a valid interpretation of your interval.

(d) Find the margin of error in your estimate.