Math 153 - Quiz 10
December 1, 2016

Name $\qquad$
Score $\qquad$

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 $\sigma=0.053 \mathrm{in}$. 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.
