

Pledge:

10/24/2007  
Dr. Lunsford

MATH 171  
Quiz 4

Name: \_\_\_\_\_  
30 Points Possible

Please show all work on this quiz. Please be sure to show all calculator input.

**Problem I.** A machine manufactures parts whose diameters vary according to the normal distribution with mean 40.150 millimeters (mm) and standard deviation 0.003 mm. (9 points total)

(a) If an inspector randomly selects a part manufactured by this machine, what is the percent chance that the part will have a diameter less than 40.148 mm? (4 points)

(b) If an inspector randomly selects four parts manufactured by this machine, what is the percent chance that the four parts will have an average diameter less than 40.148 mm? (5 points)

**Problem II.** A class survey in a large class for first year college students asked, “About how many minutes do you study on a typical weeknight?” The mean response of the 269 students was 137 minutes. Suppose we know that the typical weeknight study time of all first year students who take this class at this university is normally distributed with a standard deviation of 65 minutes. Find a 99% confidence interval for the mean typical weeknight study time of all first year students who take this class at this university. Be sure to clearly show all calculator input. (4 points)

**Problem III.** Suppose we want to compute an 87.3% confidence interval for a population mean. What is the critical value (i.e. value of  $z^*$ ) we would need to use? (4 points)

**Problem IV.** It is desired to compute a 92% confidence interval to estimate the mean height of women college basketball players in the USA. Please answer the following. (13 points total)

(a) What assumptions must be satisfied in order to compute a z-interval? Please make sure to state the assumptions in the context of this problem. (5 points)

(b) Suppose the 92% confidence interval computed was (70 inches, 74 inches). Write a complete English sentence explaining the meaning of the confidence interval in the context of this problem. (3 points)

(c) What is the margin of error for the confidence interval given in part (b)? (3 points)

(d) How would the margin of error for the confidence interval given in part (b) be affected if a larger sample size was used to compute the confidence interval? (2 points)