

Pledge:

10/24/2007  
Dr. Lunsford

MATH 171  
Quiz 4

Name: Solution  
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)

$$\text{normalcdf}(-1E99, 40.148, 40.150, 0.003) = .2525$$

25.25% chance

(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)

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}} = \frac{.003}{\sqrt{4}} = \frac{.003}{2} = .0015$$

$$\text{normalcdf}(-1E99, 40.148, 40.150, 0.0015) = .0912$$

9.12% chance

**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)

STAT/TESTS/zInterval

$$\begin{aligned}\sigma &= 65 \\ \bar{x} &= 137 \\ n &= 269\end{aligned}$$

(126.79 min., 147.21 min.)

OR use formula  $\bar{x} \pm z^* \frac{\sigma}{\sqrt{n}}$  with  $\bar{x}$ ,  $\sigma$  and  $n$  given above and  $z^* = 2.576$  ( $\text{invNorm}(.995) = z^*$ )

