

Pledge:

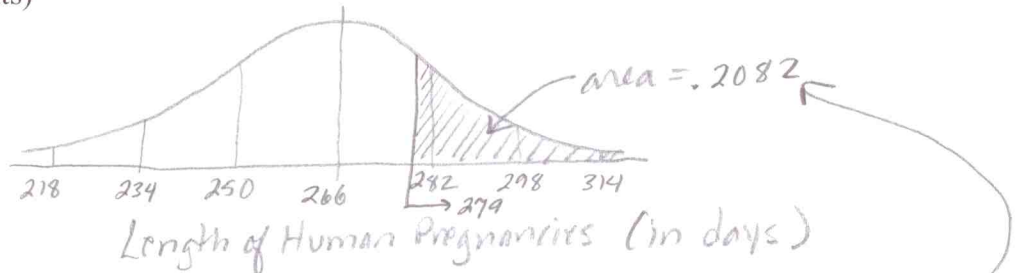
2/13/2007  
Dr. Lunsford

MATH 171  
Quiz 3

Name: Solution  
20 Points Possible

I. The length of human pregnancies from conception to birth can be modeled with a distribution that is approximately normal with mean 266 days and standard deviation 16 days. Please answer the following questions. Be sure to show all calculator input for full credit. (10 points total)

a. Draw a graph of the distribution. Be sure to draw the distribution with proper shape, label your axis, and show variable values at  $\pm 1$ ,  $\pm 2$ , and  $\pm 3$  standard deviations from the mean. (4 points)




b. According to this model, what percent of human pregnancies last longer than 279 days? Write your answer using a complete English sentence. Show the answer graphically on the distribution function you drew in part (a). (2 points)

$$\text{normalcdf}(279, 1E99, 266, 16) = .2082$$

Using this model, 20.82% of human pregnancies last longer than 279 days.

c. Approximately 7% of all infants are premature. Using this model, find the pregnancy times that would result in a premature birth. Please write your answer using a complete English sentence. (2 points)


$$\text{invNorm}(.07, 266, 16) = 242.39$$

↓  
? Pregnancy lengths shorter than 242.39 days would result in premature births.

d. What is the z-score for a pregnancy that lasts 279 days? (1 point)

$$z = \frac{x - \mu}{\sigma} = \frac{279 - 266}{16} = 0.8125$$

e. What length of pregnancy has a z-score of  $z = -2.23$ ? (1 point)

$$x = \mu + \sigma z = 266 + (-2.23)(16) = 230.32 \text{ days}$$

