

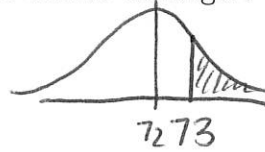
# Quiz 6

STAT 381, APPLIED STATISTICAL METHODS I, SPRING 2015

NAME:

**Problem 1.** (5 points) The length of 6ft extension cords made by a factory follows a normal distribution with mean 72 inches and standard deviation .6 inches. What is the probability that a cord sampled at random is 73 inches or longer?

$$X \sim N(72, .6^2)$$



$$P(X > 73)$$

$$= \text{normalcdf}(73, 1000, 72, .6)$$

$$\text{or } Z = \frac{73-72}{.6} = 1.667 \quad P(Z > 1.667) = \text{normalcdf}(1.667, 10)$$

$$\text{or } 1 - \Phi(1.667)$$

$$\boxed{.0478}$$

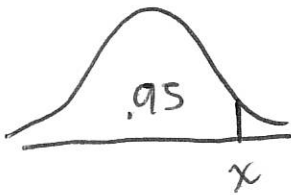
**Problem 2.** (5 points) The length of time between text messages is on average 6 minutes, and follows an exponential distribution. What is the probability you don't get a text in the next 10 minutes?

$$X \sim \text{exp}(6)$$

$$P(X > 10) = \int_{10}^{\infty} \frac{1}{6} e^{-x/6} dx = -e^{-x/6} \Big|_{10}^{\infty} = e^{-10/6} = \boxed{.1889}$$

**Bonus** (3 points) Based on Problem 1, what is the length cutoff for the longest 5% of the cords (i.e. the 95th percentile)?

$$\text{invNorm}(.95, 72, .6) = \boxed{72.987 \text{ inches}}$$



$$\text{or } Z_{.95} = \cancel{1.64} 1.64 \text{ (or } 1.65)$$

$$x = 72 + (.6)(1.64) = 72.984 \text{ in}$$