MATH 262

Section 3.3 Day 21

1. Let Z be a standard normal random variable.

   (a) Draw a diagram that represents $P(Z \leq 0.8)$. Then compute this probability.

   (b) Draw a diagram that represents $P(Z \leq c) = 0.4$. Then find a number c that satisfies this equation.

2. Let X be a normal random variable with mean 24 and standard deviation 2.

   (a) Draw a diagram that represents $P(23 \leq X \leq 25)$. Then compute this probability.

   (b) Draw a diagram that represents $P(X \geq c) = 0.2$. Then find a number c that satisfies this equation.

3. What is the probability that a normal random variable is within 1.5 standard deviations of its mean? Does this depend on the actual values of the mean and standard deviation?

4. Suppose that a fair, 6-sided die is rolled 1000 times. Use a normal distribution to approximate the probability that the number 6 appears between 150 and 200 times (inclusive).

5. Let $f(x)$ denote the standard normal pdf. Estimate the value of $f(1)$ using only the information in Table A.3 in the text.

6. Let $f(x)$ denote the pdf of the $N(\mu, \sigma)$ distribution. Show that the points of inflection lie at $x = \mu \pm \sigma$. (*Hint*: differentiate twice with respect to x.)