Statistics, Day 7

Objectives: To use technology to solve problems with normally distributed data

To determine if a data set can be represented by a normal distribution.

Warm-up: Young women’s heights are approximately normally distributed with a mean of 64.5 and a standard deviation of 2.5.

Draw a sketch of the normal distribution and label the mean, and + 1, 2, 3 standard deviations from the mean.

What percentage of young women have heights between 62” and 67”?

What percentage is taller than 69.5”?

What is the probability that a randomly selected woman is less than 62”?

What if we wanted to know what percent of women is between 63” and 66” tall? Can you make a guess?

To determine the percentage of women between 63” and 66”, we need to use a calculator, computer, or tables. We will use the calculator’s normal cumulative distribution function. Go to 2nd VARS and under the DISTR menu select 2:normalcdf. After the parenthesis, enter the lower bound of the interval you want, the upper bound, the mean and the standard deviation. It should read normalcdf (63, 66, 64.5, 2.5). Draw the curve and shade the appropriate area.

Example: What percentage of women are taller than 68 inches? (Use 1E99 as the upper bound). Draw the curve and shade the appropriate area.

Example: What percentage of women are shorter than 60 inches? (Use -1EE99 as the lower bound).

Example: A teacher gave a test and recorded the following scores for a random sample of 16 of his students. Do the test scores seem to follow an approximately normal distribution? What are the mean and standard deviation?

85, 76, 83, 82, 75, 76, 73, 76, 72, 66, 80, 74, 70, 78, 70, 79

Based on this sample of 16 students, it would be reasonable to represent the population of all of the test scores for that teacher as an approximately normal distribution with a mean of about 76 and a standard deviation of about 5. Draw the normal curve below.

If a passing grade on the test is a 70%, about what percent of all the teacher’s students can be expected to pass the test?

Would you be surprised if a student scored 95% or more? Explain your reasoning.