Math 150

Section 10.4 Normal Distributions and Boxplots

Normal Distributions

Properties of every normal curve:

1. Its peak occurs directly above the mean μ.
2. The curve is symmetric about the vertical line through the mean.
3. The curve never touches the horizontal axis.
4. The area under the curve (and above the horizontal axis) is 1.

Normal curve and Area

The area of the shaded region under the normal curve from a to b is the probability that an observed data value will be between a and b.

z-score

If a normal distribution has mean μ and standard deviation σ, then the z-score for the number x is

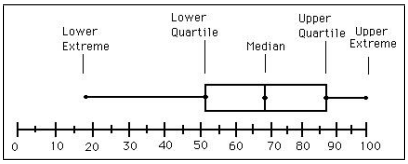
$$z = \frac{x - \mu}{\sigma}.$$

Area Under a Normal Curve

The area under a normal curve between $x = a$ and $x = b$ is the same as the area under the standard normal curve between the z-score for a and the z-score for b.

Boxplots

Boxplots are another graphical means of presenting key characteristics of a data set:



The number Q_1 is called the first quartile, the median Q_2 is called the second quartile, and Q_3 is called the third quartile.