Properties of the Normal Distribution

Uniform Distribution: Probabilities are the same all the way across. Shape is a rectangle with area (probability) equal to 1.

1. Uniform Probability Distribution

A particular process has a uniform probability distribution between 10 and 30.

a) Draw the graph of the density curve
b) What is the probability that the process is greater than 25?
c) What is the probability that the process is less than 17?
d) What is the probability that the process is between 12 and 17?

Probability Density Function

An equation used to compute probabilities of continuous random variables that satisfies:

1. The total area under the graph of the equation over all possible values of the random variable must equal 1
2. The height of the graph >= 0 for all values.

Note:

The area under the graph of a density function over an interval represents the probability of observing a value of the random variable in that interval

Normal Distribution

A continuous random variable has a normal probability distribution if its relative frequency histogram of the random variable has the shape of a normal curve.

Properties of the Normal Density Curve

1. It is symmetric about its mean
2. Since mean = median = mode, highest point occurs at x = μ
3. Inflection points at $\mu - \sigma$ and $\mu + \sigma$
4. Area under curve is 1
5. Area on the right equals area on the left (each being ½)

Properties of the Normal Density Curve (cont.)

6. The graph as you go to the left and right doesn't actually touch the horizontal axis, just comes real close.
7. μ +-1σ = 68% of data

   μ +-2σ = 95% of data

   μ +-3σ = 99.7% of data