**Poisson Distribution**

**Poisson Distribution Expected**

**Poisson Distribution Variance**

**Poisson Distribution Standard Deviation**

**Tchebysheff’s Theorem**

Let Y be a random variable with mean and finite variance . Then, for any constant k > 0,

**Distribution Function (cdf)**

**Properties of a Distribution Function**

1. is a nondecreasing function of y. (If y1 and y2 are any values such that y1 < y2, then )

**Probability of Density Function**

Let be the distribution function for a continuous random variable Y. Then f(y), given by,

**Properties of a Density Function**

**Interval Probabilities**

**Requirements for Interval Probability**

For to be a legitimate probability density function,

**Expected for Continuous Random Variables**

**Theorem 4.4 (Expected for a function in**stead **of the random variable)**

**Continuous Random Variable Axioms**

Let c be a constant and let be functions of a continuous random variable Y. Then the following results should hold:

1. .

**Variance for Continuous Random Variables**

**Uniform Probability Distribution**

If , a random variable is said to have a continuous uniform probability distribution on the interval if and only if the density function of is

**Uniform Probability Distribution (shortcut)**

**Expected for Uniform Probability Distribution**

**Variance for Uniform Probability Distribution**

**Rule**

**Gamma Probability Distribution**

A random variable is said to have a *gamma di*stribution *with parameters* if and only if the density function of is

where

**Expected for Gamma Probability Distribution**

**Variance for Gamma Probability Distribution**

**Chi-square**

Let be a positive integer. A random variable is said to have a *chi-square* *distribution with degrees of freedom* if and only if is a gamma-distributed random variable with parameters and .

**Expected for Chi-square**

**Variance for Chi-square**

**Exponential Distribution of the Gamma Function**

A random variable is said to have a *exponential di*stribution *with parameters* if and only if the density function of is

**Expected for Exponential Distribution of the Gamma Function**

**Variance for Exponential Distribution of the Gamma Function**