**Definition 1.1**

The mean of a sample of n

**Definition 1.2**

The variance of a sample of measurements

**Definition 1.3**

The standard deviation of a sample of measurements is the positive square root of that variance

**Definition 2.6**

Suppose S is a sample space associated with an experiment. To every event A in S (A is a subset of S), we assign a number, P(A), called the probability of A, so that the following axioms hold:

Axiom 1:

Axiom 2:

Axiom 3: If

**Definition 2.7/Theorem 2.2**

An ordered arrangement of r distinct objects is called a permutation. The number of ways of ordering n distinct objects taken r at a time will be designated by the symbol

**Definition 2.9**

The conditional probability of an event A, given that an event B has occurred

**Definition 2.10**

Two events A and B are said to be independent if any one of the following holds:

**Definition 2.11**

For some positive integer k, let the sets be such that

**Definition 3.4**

Let Y be a discrete random variable with the probability function p(y)

**Definition 3.5**

If Y is a random variable with mean E(Y) = , the variance of a random variable Y is defined to be the expected value of (Y-

**Definition 3.7**

A random variable Y is said to have a binomial distribution based on n trials with success probability p if and only if

**Definition 3.8**

A random variable Y is said to have a geometric probability distribution if and only if

**Definition 3.9**

A random variable Y is said to have a negative binomial probability distribution if and only if

**Theorem 2.2/Definition 2.7**

An ordered arrangement of r distinct objects is called a permutation. The number of ways of ordering n distinct objects taken r at a time will be designated by the symbol

**Theorem 2.3**

The number of ways of partitioning n distinct objects into k distinct groups

**Theorem 2.4**

The number of unordered subsets of size r chosen (without replacement) from n available objects

**Theorem 2.5**

The Multiplicative Law of Probability: The probability of the intersection of two events A and B

**Theorem 2.6**

The Additive Law of Probability: The probability of the union of two events A and B

**Theorem 2.7**

If a is an event

**Theorem 2.8**

Assume that { is a partition of S (see definition 2.11) such that . Then for any event A

**Theorem 2.9**

Assume that { if a partition of S (see definition 2.11) such that . Then

**Theorem 3.2**

Let Y be a discrete random variable with probability function p(y) and g(Y) be a real-valued function of Y

**Theorem 3.3**

Let Y be a discrete random variable with probability function p(y) and c be a constant

**Theorem 3.4**

Let Y be a discrete random variable with probability function p(y), g(Y) be a function of Y, and c be a constant

**Theorem 3.5**

Let Y be a discrete random variable with probability function p(y) and be k functions of Y

**Theorem 3.6**

Let Y be a discrete random variable with probability function p(y) and mean E(Y) = μ

**Theorem 3.7**

Let Y be a binomial random variable based on n trials and success probability p

**Theorem 3.8**

If Y is a random variable with a geometric distribution

**Theorem 3.9**

If Y is a random variable with a negative binomial distribution