Formula Sheet

Definition 1.1 Mean

Definition 1.2 Variance

Definition 1.3 Standard Deviation

Definition 2.1

An *experiment* is the process by which an observation is made.

Definition 2.2

A *simple event* is an event that cannot be decomposed. Each simple event corresponds to one and only one *sample point*. The letter *E* with a subscript will be used to denote a simple event or the corresponding sample point.

Definition 2.3

The *sample space* associated with an experiment is the set consisting of all possible sample points.

Definition 2.4

A *discrete sample space* is one that contains either a finite or a countable number of distinct sample points.

Definition 2.5

An *event* is a discrete sample space *S* is a collection of sample points--that is, any subset of *S*.

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 form a sequence of pairwise mutually exclusive events in *S* (that is if i ≠ j), then

Definition 2.7 Permutations

Theorem 2.3 Multinomial Coefficients

Definition 2.8 Combinations

Definition 2.9 Conditional Probability

Definition 2.10

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

Otherwise they are said to be independent

Theorem 2.5 Multiplicative Law of Probability

Theorem 2.6 Additive Law of Probability

If A and B are mutually exclusive events then,

Theorem 2.7

If A is an event, then

Definition 2.11 and Theorem 2.8 Law of Total Probability

Theorem 2.9 Bayes Theorem

Definition 3.4 Expected Value of Y

Definition 3.5 Variance of Y

The standard deviation of Y is

Definition 3.7 Binomial Distribution

Definition 3.8 Geometric Distribution