Formula Sheet:

Definition 1.1: mean (central tendency)

Definition 1.2: Variance

Definition 1.3: Standard deviation

Distributive laws:

De Morgan’s Law:

Definition 2.6:

Probability formulas:

Theorem 2.1: MN rule

With m elements . It is possible to form pairs containing one element from each group.

Theorem 2.2: Permutation

Theorem 2.3: Multinomial Distribution

Theorem 2.4 Combinations

Definition 2.9: 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

Otherwise, the events are said to be dependent.

Theorem of total probability:

Bayes theorem: For two events A and B in a sample space s

If 0 < P(B) < 1, we may write by the theorem of total probability

Note:

Definition 3.4: expected value of Discrete random Y

Definition 3.5: variance

Probability Mass Function (pmf) for Y, p(.)

If y is element of Y, p(y) > 0 otherwise p(y) = 0

Definition 3.7 Binomial distribution

3.7: Y is a binomial random variable based on n trials and success probability p

Definition 3.8: Geometric Distribution

3.8: If Y is a random variable with a geometric distribution

Extra Formulas: for geometric distribution

Success occurs on or before the nth trial.

Success occurs before the nth trial.

Success occurs on or after the nth trial.

Success occurs after the nth trial.