Statistics Formula Sheet

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## Chapter 1

**Definition 1.1**

This finds a *mean* of a sample of *n* measured responses:

**Definition 1.2**

Formula for *variance*:

**Definition 1.3**

Formula for *standard deviation*:

## Chapter 2

**Theorem 2.1**

The *mn rule* states with two groups *m* and *n* of elements:

pairs containing one element from each group.

**Theorem 2.2**

Formula for *permutation*:

**Theorem 2.4**

Formula for *combination*:

**Definition 2.9**

The *conditional probability* formula of an event A given event B has occurred:

**Definition 2.10**

Two events A and B are said to be *independent* if any of these are true:

Otherwise, they are *dependent*.

**Theorem 2.5**

The *Multiplicative Law* of Probability:

If *A* and *B* are independent, then:

**Theorem 2.6**

The *Additive Law* of Probability:

If *A* and *B* are mutually exclusive events, then:

**Theorem 2.8**

The *Law of Total Probability:*

**Theorem 2.9**

*Bayes’ Rule:*

## Chapter 3

**Definition 3.7**

*Binomial Probability Distribution:*

**Theorem 3.7**

*Binomial Distribution* Expectance and Variance:

**Definition 3.8**

*Geometric Probability Distribution:*

**Theorem 3.8**

*Geometric Distribution* Expectance and Variance:

**Definition 3.9**

*Negative Binomial Probability Distribution:*

**Theorem 3.9**

*Negative Binomial Distribution* Expectance and Variance:

**Definition 3.10**

*Hypergeometric Probability Distribution:*

**Theorem 3.10**

*Hypergeometric Distribution* Expectance and Variance:

**Definition 3.11**

*Poisson Probability Distribution:*

**Theorem 3.14**

*Tchebysheff’s Theorem:*

or

## Chapter 4

**Definition 4.3**

*Probability Density Function:*

**Definition 4.5**

*Continuous Random Variable* Expectance:

**Definition 4.6**

*Uniform Probability Distribution:*

**Theorem 4.6**

*Uniform Probability Distribution* Expectance and Variance:

**Definition 4.11**

*Gamma Exponential Distribution:*

**Theorem 4.10**

*Exponential Distribution* Expectance and Variance:

## Chapter 5

**Definition 5.1**

*Joint Probability Function:*

**Definition 5.2**

*Joint Distribution Function:*

)

**Definition 5.4**

*Marginal Probability Functions:*

**Definition 5.4**

*Marginal Density Functions:*

**Definition 5.5**

*Conditional Discrete Probability Function:*

**Definition 5.6**

*Conditional Distribution Function:*

**Definition 5.7**

*Conditional Density Function:*

**Definition 5.8 & Theorem 5.4**

*Random Variables and are Independent if:*

-Distribution Function

-Mass Function

-Density Function

**Theorem 5.5**

*Split Independent Function:*