Dillon Groh

Probability and Applied Statistics Formula Sheet

Definition 1.1 Mean

Definition 1.2 Variance

Definition 1.3 Standard Deviation

Definition 2.6 Probability

Theorem 2.1

Definition 2.7 Permutation

Theorem 2.2

Theorem 2.3

Definition 2.8 Combinations

Theorem 2.4

Definition 2.9 Conditional Probability

Definition 2.10 Independence and Dependence

Theorem 2.5 Multiplicative Law of Probability

Theorem 2.6 The Additive Law of Probability

Theorem 2.7

Definition 2.11 Partition

Theorem 2.8

Theorem 2.9 Bayes’ Rule

Definition 2.13 Random Sample

Definition 3.2 Sum of the Probabilities

Definition 3.3 Probability Distribution

Theorem 3.1

Definition 3.4 Expected Value

Theorem 3.2

Definition 3.5 Standard Deviation

Theorem 3.4

Theorem 3.5

Theorem 3.6

Definition 3.7 Binomial Distribution

Definition 3.8 Geometric Probability Distribution

Theorem 3.7

Definition 3.8 Probability Distribution

Theorem 3.8

Definition 3.9

Theorem 3.9

Definition 3.10 Hypergeometric Probability Distribution

Theorem 3.10

Definition 3.11 Poisson Probability Distribution

Theorem 3.11

Definition 3.12 kth moment of a random variable taken about the origin

Definition 3.13 kth moment of a random variable taken about its mean

Definition 3.14 Moment generating function

Definition 3.15 Probability Generating Function

Definition 3.16 Factorial moment

Theorem 3.14 Tchebysheff’s Theorem

Definition 4.1 Distribution Function

Definition 4.3 Probability Density Function

Theorem 4.3

Definition 4.5

Theorem 4.4

Definition 4.6 Uniform Probability Distribution

Theorem 4.6

Definition 4.8 Normal Probability Distribution

Definition 4.9 Gamma Distribution with Parameters

Theorem 4.8

Theorem 4.9

Definition 4.11 Exponential Distribution with Parameters

Theorem 4.10

Definition 4.12 Beta Probability Distribution

Theorem 4.11

Definition 4.14

Theorem 4.12

Theorem 4.13 Tchebysheff’s Theorem

Definition 4.15 Mixed Distribution Function

Definition 5.1 Joint Probability Function

Definition 5.2 Joint Distribution Function

Definition 5.3 Joint Probability Density Function

Definition 5.4 Marginal Probability and Marginal Density Functions

Definition 5.5 Conditional Discrete Probability Function

Definition 5.6 Conditional Distribution Function