

Helpful Formulas

$$\text{(Mean)} \quad \mu = \frac{\sum_{i=1}^N x_i}{N} \quad \bar{x} = \frac{\sum_{i=1}^n x_i}{n}$$

$$\text{(Range)} \quad R = x_L - x_S$$

$$\text{(Variance)} \quad \sigma^2 = \frac{\sum_{i=1}^N (x_i - \mu)^2}{N} \quad s^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}$$

$$\text{(Standard Deviation)} \quad \sigma = \sqrt{\sigma^2} \quad s = \sqrt{s^2}$$

$$\text{(Coefficient of Variation)} \quad C.V = \frac{s}{\bar{x}}(100)\%$$

$$\text{(Quartiles for Ordered Array)} \quad Q_1 = \frac{n+1}{4} \quad Q_2 = \frac{n+1}{2} \quad Q_3 = \frac{3(n+1)}{4}$$

$$\text{(Interquartile Range)} \quad IQR = Q_3 - Q_1$$

$$\text{(Classical Probability)} \quad P(E) = \frac{m}{N}$$

$$\text{(Relative Frequency Probability)} \quad P(E) = \frac{m}{n}$$

$$\text{(Properties of Probability)} \quad P(E_i) \geq 0 \quad P(E_1) + P(E_2) + \dots + P(E_n) = 1 \quad P(E_i + E_j) = P(E_i) + P(E_j)$$

$$\text{(Multiplication Rule)} \quad P(A \cap B) = P(B)P(A|B) = P(A)P(B|A)$$

$$\text{(Conditional Probability)} \quad P(A|B) = \frac{P(A \cap B)}{P(B)}$$

$$\text{(Addition Rule)} \quad P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$\text{(Independent Events)} \quad P(A \cap B) = P(A)P(B)$$

$$\text{(Complementary Events)} \quad P(\bar{A}) = 1 - P(A)$$

$$\text{(Marginal Probability)} \quad P(A_i) = \sum P(A_i \cap B_j)$$