Formula Sheet

Sample Mean: $\bar{x} = \sum \frac{x_i}{n}$

Population Mean: $\mu = \sum \frac{x_i}{N}$

Sample std.dev: $s = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}}$

Population std.dev: $\sigma = \sqrt{\frac{\sum(x-\mu)^2}{N}}$

Standardized variable: $z = \frac{x-\mu}{\sigma}$

IQR = Q_3 - Q_1

Lower Limit = Q_1 – (1.5)IQR

Upper Limit = Q_3 + (1.5)IQR

General Addition Rule: P(A or B) = P(A) + P(B) – P(A & B)

Complementation Rule: $P(A^C)$ = 1- P(A))

Conditional Probability Rule: $P(A|B) = \frac{P(A \& B)}{P(B)}$

General Multiplication Rule: P(A & B) = P(A|B) · P(B)

Independent events: P(A|B) = P(A)

If A and B are independent events: P(A & B) = P(A) · P(B)

Mean of a discrete random variable: $\mu = \sum xP(X = x)$

Binomial Probability Formula: $P(X = x) = \frac{n!}{x!(n-x)!} \cdot p^x(1-p)^{n-x}$

Mean of a binomial random variable: μ = np

Std.Dev. of a binomial random variable: $\sigma = \sqrt{np(1-p)}$

Mean of the variable $\bar{x}$: $\mu_{\bar{x}} = \mu$

Standard deviation of the variable $\bar{x}$: $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$

Mean of the variable $\hat{p}$: $\mu_{\hat{p}} = p$

Standard deviation of the variable $\hat{p}$: $\sigma_{\hat{p}} = \sqrt{\frac{p(1-p)}{n}}$