

Formula Sheet

$$\sigma^2 = \frac{\sum (x_i - \mu)^2}{N}$$

$$s^2 = \frac{\sum (x_i - \bar{x})^2}{n-1} = \frac{\sum x_i^2 - \frac{(\sum x_i)^2}{n}}{n-1}$$

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$P(A \cap B) = P(A) * P(B | A)$$

$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{P(A) * P(B|A)}{P(B)}$$

$$P(A|B) = \frac{P(A) * P(B|A)}{[P(A) * P(B|A)] + [P(A^C) * P(B|A^C)]}$$

	With repetition	Without repetition
Combinations	${}_{n+r-1}C_r = \frac{(n+r-1)!}{r! * (n-1)!}$	${}_nC_r = \frac{n!}{r! * (n-r)!}$
Permutations	n^r	${}_nP_r = \frac{n!}{(n-r)!}$

$$E(x) = \sum x * p(x)$$

$$E(x) = \int x * p(x) dx$$

$$E(x^2) = \sum x^2 * p(x)$$

$$E(x^2) = \int x^2 * p(x) dx$$

$$\text{Var}(x) = E(x^2) - [E(x)]^2$$

$$\text{Var}(x) = \sum (x - \mu)^2 * p(x)$$

$$\text{Var}(x) = \int (x - \mu)^2 * p(x) dx$$

$$P(X = k) = {}_nC_k * p^k * (1-p)^{n-k}$$

$$\mu = np$$

$$\sigma^2 = npq$$

$$P(X = k) = (1-p)^{k-1} p$$

$$\mu = \frac{1}{p}$$

$$\sigma^2 = \frac{1-p}{p^2}$$

$$f(x) = \frac{1}{b-a}$$

$$\mu = \frac{a+b}{2}$$

$$\sigma^2 = \frac{(b-a)^2}{12}$$

$$Z = \frac{x - \mu}{\sigma}$$

$$Z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}}$$

$$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$$

$$n = \left(\frac{\sigma * Z_{\alpha/2}}{ME} \right)^2$$

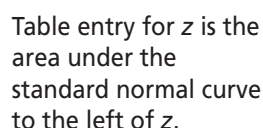
$$n = p(1-p) \left(\frac{Z_{\alpha/2}}{ME} \right)^2$$

$$\bar{x} \pm z_{\frac{\alpha}{2}} * \frac{\sigma}{\sqrt{n}}$$

$$p \pm z_{\frac{\alpha}{2}} * \sqrt{\frac{p(1-p)}{n}}$$

$$\bar{x}_1 - \bar{x}_2 \pm z_{\frac{\alpha}{2}} * \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

$$p_1 - p_2 \pm z_{\frac{\alpha}{2}} * \sqrt{\frac{p_1(1-p_1)}{n_1} + \frac{p_2(1-p_2)}{n_2}}$$



Standard normal probabilities (continued)

[illegible]