

Formulas to be provided.
It will be a handout or link!

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

$$s = \sqrt{s^2}$$

$${}_n P_n = n(n-1)(n-2)\dots 3 \cdot 2 \cdot 1 = n!$$

$${}_n P_r = \frac{n!}{(n-r)!}$$

$$P = \frac{n!}{r!s!t!}$$

$${}_n C_r = \binom{n}{r} = \frac{n!}{r!(n-r)!}$$

$$(A \cup B)^c = A^c \cap B^c$$

$$P(E) = \frac{n(E)}{n(S)}$$

$$P(E^c) = 1 - P(E)$$

$$P(E \cup F) = P(E) + P(F) - P(E \cap F)$$

$$P(E | F) = \frac{P(E \cap F)}{P(F)}$$

$$\mu_X = E[X] = x_1 p_1 + x_2 p_2 + \dots + x_n p_n$$

$$\begin{aligned} \sigma_X^2 &= \text{Var}[X] = (x_1 - \mu_X)^2 p_1 + (x_2 - \mu_X)^2 p_2 + \dots + (x_n - \mu_X)^2 p_n \\ &= \sum (x_i - \mu_X)^2 p_i \end{aligned}$$

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

$$E[W] = E[aX + b] = aE[X] + b$$

$$\sigma_W^2 = \text{Var}[W] = \text{Var}[aX + b] = a^2 \text{Var}[X]$$

$$E[X + Y] = E[X] + E[Y]$$

$$\sigma_{X+Y}^2 = \text{Var}[X + Y] = \text{Var}[X] + \text{Var}[Y]$$

$$E[X - Y] = E[X] - E[Y]$$

$$\sigma_{X-Y}^2 = \text{Var}[X - Y] = \text{Var}[X] + \text{Var}[Y]$$

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

$$P(X \geq k) = 1 - P(X \leq (k-1))$$

$$\mu = E[X] = np$$

$$\sigma^2 = np(1-p)$$

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

$$P(X > n) = (1-p)^n$$

$$E[X] = \mu = \frac{1}{p}$$

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