Formula Sheet

1. $\mu = \sum_{i=1}^{N} \frac{X_i}{N}$
2. $\bar{X} = \sum_{i=1}^{n} \frac{X_i}{n}$
3. $\sigma^2 = \sum_{i=1}^{N} \frac{(X_i - \mu)^2}{N}$
4. $\sigma = \sqrt{\sum_{i=1}^{N} \frac{(X_i - \mu)^2}{N}}$
5. $S^2 = \sum_{i=1}^{N} \frac{(X_i - \bar{X})^2}{n-1}$
6. $S = \sqrt{\sum_{i=1}^{N} \frac{(X_i - \bar{X})^2}{n-1}}$
7. $\bar{R}_G = [(1+R_1)\times(1+R_2)\times\cdots\times(1+R_n)]^{\frac{1}{n}} - 1$
8. $CV = \left(\frac{S}{\bar{X}}\right) \times 100\%$
9. $Z = \frac{X - \bar{X}}{S}$
10. $Q_1 = \frac{1}{4}(n+1)$ ranked value
11. $Q_1 = \frac{1}{2}(n+1)$ ranked value
12. $Q_1 = \frac{3}{4}(n+1)$ ranked value
13. $IQR = Q_3 - Q_1$
14. $Cov(X,Y) = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$
15. $r = \frac{Cov(X,Y)}{S_X S_Y}$
16. $P(A \cup B) = P(A) + P(B) - P(A \cap B)$
17. $P(A|B) = \frac{P(A \cap B)}{P(B)}$
18. $P(A \cap B) = P(A|B)P(B)$
19. $P(A \cap B) = P(A)P(B)$
20. $n! = (n)(n-1)\cdots(1)$
21. ${}_nP_X = \frac{n!}{(n-X)!}$
22. ${}_nC_X = \frac{n!}{X!(n-X)!}$
23. $P(A) = P(A|B_1)P(B_1) + P(A|B_2)P(B_2) + \cdots + P(A|B_k)P(B_k)$

    Where $B_1, B_2, \ldots, B_k$ are k mutually exclusive and collectively exhaustive events
24. $P(B_i|A) = \frac{P(A|B_i)P(B_i)}{P(A|B_1)P(B_1) + P(A|B_2)P(B_2) + \cdots + P(A|B_k)P(B_k)}$