Standard deviation = $\sqrt{\frac{\sum(x-x_1)^2}{n-1}}$

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

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

Conditional probability = $P(A\,B) = \frac{P(A\cap B)}{P(B)}$

Multiplicity of law of probability = $P(A \cap B) = p(A) \cdot P(B\,A)\ P(B) \cdot (P\,A\,B)$

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

Bayes Theorem = $P(A\,B) = \frac{(P(A\,B)\,P(B))}{P(A)}$

Discrete random variables $E[y] = y \in Y \sum \quad y\,p(y)$=

Variance = $V[y] = E[(y-\mu)^2]$

Standard deviation = $\sqrt{V[y]}$

Binomial distribution =$p(Y) = {}^{n}_{y}\ p^y q^{n-y}$

Geometric distribution = $q^{y-1}P$

Hyper Geometric distribution = $\begin{matrix} R \\ y \end{matrix} \cdot \begin{matrix} n-R \\ n-y \end{matrix}$

Variance = $n\left(\frac{r}{N}\right)\left(\frac{(N-r)}{N}\right)$

Poisson distribution = $\frac{\lambda^y}{y!^e} - \lambda$

Variance = λ

TChebysheff's theorem = $P(|y-\mu| \geq k\sigma) \leq \frac{1}{k^2}$

Expect values for continuous variables = $E(Y) = \int_{-\infty}^{\infty} y f(y) dy$

Variance values for continuous variables =$E(Y) = \int_{-\infty}^{\infty} y^2\, f(y) dy$

The uniform probability Distribution = $\vdash_{0}^{\frac{1}{b-a}} b \leq y \leq a$

Expected = $\int_a^b xf(x)dx$

Variance = $\int_a^b \frac{x^2}{b-a} dx$

The normal distribution = $f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(y-\mu)^2}{(2\sigma)^2}}$

Expected =μ

Variance = σ^2

The Gama Distribution = $\frac{y^{\alpha-1} e^{-\frac{y}{\beta}}}{\beta^\alpha \Gamma(\alpha)} 0 \leq y < \infty$

Expected =$\alpha\beta$

Variance =$\alpha\beta^2$

The beta probability distribution = $\frac{y^{\alpha-1}(1-y)^{\beta-1}}{\beta(a,\beta)} 0 \leq y \leq 1$

Expected = $\frac{\alpha}{\alpha+\beta}$

Variance = $\frac{\alpha\beta}{(\alpha+\beta)^2(\alpha+\beta+1)}$

Multivariable probability distribution = $p(y1 = y1) \cap (y2 = y2)$

Marginal =$\sum p(x, y)$

Conditional =$\frac{P(x,y)}{P2(y)}$