$P(A|B)=\frac{P(AB)}{P(B)}$, $P(A)=\sum\limits_{k=1}^{n}P(A|B_k)P(B_k)$, $P(B_i|A)=\frac{P(A|B_i)P(B_i)}{\sum\limits_{k=1}^{n}P(A|B_k)P(B_k)}$

$f_X(x)=P(X=x)$, $E(H(X))=\sum_x H(x)f_X(x)$,
$Var(X)=E((X-E(X))^2)=EX^2-(EX)^2$

$P(|X-\mu|\geq c\sigma)\leq 1/c^2$
$\hat{E}X=\frac{X_1+X_2+...+X_n}{n}$, $\hat{V}X=\frac{X_1^2+X_2^2+...+X_n^2}{n-1}-\frac{(X_1+X_2+...+X_n)^2}{n(n-1)}$

$G_X(z)=E(z^X),\ G'_X(1)=EX,\ G''_X(1)+G'_X(1)-(G'_X(1))^2=VX$

$f_{XY}(x,y)=P(X=x,Y=y),\ f_X(x)=\sum\limits_y f_{XY}(x,y),\ f_Y(y)=\sum\limits_x f_{XY}(x,y)$
$E(H(X,Y))=\sum_x\sum_y H(x,y)f_{XY}(x,y)$

$Cov(X,Y)=E((X-\mu_x)(Y-\mu_y))=E(XY)-E(X)E(Y)$, $\rho_{XY}=\frac{Cov(X,Y)}{\sqrt{VarX}\sqrt{VarY}}$
$f_{X|y}(x)=f_{X|Y=y}(x)=\frac{f_{XY}(x,y)}{f_Y(y)}$

U_n: $f_X(x)=\frac{1}{n},\ G_X(e^t)=\frac{\sum\limits_{k=1}^{n}e^{tx_k}}{n},\ EX=\frac{\sum\limits_{k=1}^{n}x_k}{n},\ VX=\frac{\sum\limits_{k=1}^{n}x_k^2}{n}-\left(\frac{\sum\limits_{k=1}^{n}x_k}{n}\right)^2$

$Be(p)$: $f_X(x)=p^x(1-p)^{1-x},\ G_X(e^t)=q+pe^t,\ EX=p,\ VX=p(1-p)$

$Ge(p)$: $f_X(x)=(1-p)^{x-1}p,\ G_X(e^t)=\frac{pe^t}{1-qe^t},\ EX=\frac{1}{p},\ VX=\frac{q}{p^2}$

$Bi(n,p)$: $f_X(x)=\binom{n}{x}p^x(1-p)^{n-x},\ G_X(e^t)=(q+pe^t)^n,\ EX=np,\ VX=npq$

$NegBi(r,p)$: $f_X(x)=\binom{x-1}{r-1}p^r(1-p)^{x-r},\ G_X(e^t)=\frac{(pe^t)^r}{(1-qe^t)^r},\ EX=\frac{r}{p},\ VX=\frac{rq}{p^2}$

$HG(N,r,n)$: $f_X(x)=\frac{\binom{r}{x}\binom{N-r}{n-x}}{\binom{N}{n}},\ G_X(e^t)=\ ,\ EX=n\frac{r}{N},\ VX=n\frac{r}{N}\frac{N-r}{N}\frac{N-n}{N-1}$

$Po(k)$: $f_X(x)=\frac{e^{-k}k^x}{x!},\ G_X(e^t)=e^{k(e^t-1)},\ EX=k,\ VX=k$