$P(A \cup B) = P(A) + P(B) - P(A \cap B)$ addition rule
$P(A \cap B) = P(A)\, P(B \mid A)$ multiplication rule
$P(B \mid A) = P(A \cap B) / P(A)$ variant of above
$P(B \mid A) = P(B)$ is equivalent to A independent of B
$P(A \cap B) = P(A)\, P(B)$ is equivalent to A independent of B

$\mu_X = E X = \sum_x x\, p(x)$ expectation, or mean, of r.v. X
$= \int x\, f(x)\, dx$ expectation in continuous case

$\sigma_X = \sqrt{E(X - E X)^2}$ standard deviation of r.v. X
$= \sqrt{E X^2 - (E X)^2}$ another way to calculate it

$E(a X + b Y + c) = a E X + b E Y + c$ for r.v. X, Y
constants a, b, c
$E(X Y) = (E X) E(Y)$ if r.v. X, Y are independent

$\sigma_{X+Y} = \sqrt{\sigma_X^2 + \sigma_Y^2}$ for independent r.v. X, Y

$\sigma_{a X + b} = |a|\, \sigma_X$ in particular $\sigma_X = \sigma_{-X}$

$\sigma_{\overline{X}} = \frac{\sigma_X}{\sqrt{n}}$ $\overline{X}$ = the average of n independent r.v X_i
each having the distribution of r.v. X

$\sigma_{\overline{X}} = \sqrt{\frac{N-n}{N-1}}\ \frac{\sigma_X}{\sqrt{n}}$ when the samples are without replacement from a population of size N

$E\,\overline{X} = E\,X$ in each of the above two cases

Central Limit Theorem (CLT): The distribution of $\overline{X}$ is approximately normal (bell) in both cases above.