Combination: order doesn't matter. Select item without regard to how they are arranged. $nCr = \frac{n!}{(n-r)!r!}$.

Permutation: order is important. Count number of ways you can arrange a set of items where the sequence or arrangement matters. $nPr = \frac{n!}{(n-r)!}$.

$$\left(\sum_{i=0}^{n} X_i\right)^2 = \sum_{i=0}^{n}\sum_{j=0}^{n} X_i X_j$$

$$\frac{\sum(x-\overline{x})^2}{n} = \frac{\sum x^2}{n} - \overline{x}^2$$

Taylor Series: $e^x = \sum_{i=0}^{\infty} \frac{x^n}{n!}$

Summations: $\sum_{r=1}^{n} r = \frac{1}{2}n(n+1)$. $\sum_{r=1}^{n} r^2 = \frac{1}{6}n(n+1)(2n+1)$. $\sum_{r=1}^{n} r^3 = \frac{1}{4}n^2(n+1)^2$.

$f(x)$	$\int f(x)\,dx$
$\frac{1}{x}$	$ln\|x\|$
$\frac{1}{x^2-a^2}$	$\frac{1}{2a} ln\left\|\frac{x-a}{x+a}\right\|$ $(x > a)$
$\frac{1}{a^2-x^2}$	$\frac{1}{2a} ln\left\|\frac{a+x}{a-x}\right\|$ $(\|x\| < a)$

$\int uv'dx = uv - \int u'vdx.$

L(log)**A**(algebra)**T**(trigonometry)**E**(exponent)

$$\int \frac{f'(x)}{f(x)}dx = ln|f(x)|$$

$$\int f^n(x)f'(x)dx = \frac{1}{n+1}f^{n+1}(x) + C$$

$f(x)$	$f'(x)$
$ln\ x$	$\frac{1}{x}$
uv	$u'v + uv'$
$\frac{u}{v}$	$\frac{u'v - uv'}{v^2}$

$$x = rcos\theta, y = rsin\theta$$