CBSE Class 11 Maths Notes Chapter 7 Binomial Theorem

Binomial Expression

An expression consisting of two terms, connected by + or − sign is called binomial expression.

Binomial Theorem

If a and b are real numbers and n is a positive integer, then

The general term of $(r + 1)^{th}$ term in the expression is given by
$T_{r+1} = {}^nC_r\, a^{n-r}\, b^r$

Some Important Observations from the Binomial Theorem

The total number of terms in the binomial expansion of $(a + b)^n$ is n + 1.

The sum of the indices of a and b in each term is n.

The coefficient of terms equidistant from the beginning and the end are equal. These coefficients are known as the binomial coefficient and
${}^nC_r = {}^nC_{n-r}$, r = 0, 1, 2, 3,…, n

The values of the binomial coefficient steadily increase to a maximum and then steadily decrease.

The coefficient of x^r in the expansion of $(1 + x)^n$ is ${}^nC_r$.

In the binomial expansion $(a + b)^n$, the rth term from the end is $(n − r + 2)^{th}$ term from the beginning.

Middle Term in the Expansion of $(a + b)^n$

If n is even, then in the expansion of $(a + b)^n$, the middle term is $(\frac{n}{2} + 1)$ th term.

If n is odd, then in the expansion of $(a + b)^n$, the middle terms are $(\frac{n+1}{2})$th term and $(\frac{n+3}{2})$th term.