Tips and Tricks

1. Never read maths. It is quite easy to get in the routine of just watching videos and reading theory and questions with solution given below them. Don't make a habit of it. Rather try to avoid watching too much videos or reading just theory again and again, and start solving questions. Whenever you get stuck somewhere, mark it and move to the next question. Only at the end try to re-attempt those problems. Even after second attempt, if you don't get the question, then can take help from solution or mentors or theory/notes.

2. As always practicing different types of question is all it takes to master the concepts.

3. So try to practice questions in timed manner.

Concepts and Formulas

Infinite Binomial Expansions: when n is rational

General Form: for any x less than 1,

$$(1+x)^n = 1 + nx + \frac{n(n-1)}{2!}x^2 + \frac{n(n-1)(n-2)}{3!}x^3 + \ldots +$$
$$+ \frac{n(n-1)(n-2)\ldots(n-r+1)}{r!}x^r + \ldots \infty$$

Important Expansion:

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \ldots$$

$$e^{-x} = 1 - x + \frac{x^2}{2} - \frac{x^3}{3!} + \frac{x^4}{4!} - \frac{x^5}{5!} \ldots\ldots$$

Problem Types:

1. When three consecutive terms are given to be and Arithmetic Progression(AP):

Result used to solve:

first term + third term = 2*(second term)

2. Finding various sums of binomial coefficients:

Here trick is to be able to figure out on which expression to use binomial theorem

3. Conditioning on binomial terms:

1. first write down the condition that is given on terms
2. then simply follow solving steps to get answer

Examples for these types of questions from NCERT:

1.

Example 11 If the coefficients of a^{r-1}, a^r and a^{r+1} in the expansion of $(1 + a)^n$ are in arithmetic progression, prove that $n^2 - n(4r + 1) + 4r^2 - 2 = 0$.

2.

Example 18 If $(1 - x + x^2)^n = a_0 + a_1 x + a_2 x^2 + \ldots + a_{2n} x^{2n}$, then $a_0 + a_2 + a_4 + \ldots + a_{2n}$ equals.

(A) $\frac{3^n + 1}{2}$ (B) $\frac{3^n - 1}{2}$ (C) $\frac{1 - 3^n}{2}$ (D) $3^n + \frac{1}{2}$

3.

Example 17 If the coefficients of $(r - 5)^{th}$ and $(2r - 1)^{th}$ terms in the expansion of $(1 + x)^{34}$ are equal, find r.

Watch video and try to solve them yourself, since these are ncert examples their answer is given in the ncert book.