Important Questions for Class 11 Maths Chapter 8: These important questions for Class 11 Maths Chapter 8 Binomial Theorem are important for students as they help build a strong foundation in mathematical reasoning.

By practicing these questions students can improve their understanding of how to prove mathematical statements for all natural numbers. These questions are essential for mastering the concept of Binomial Theorem and performing well in exams as they test both conceptual clarity and problem-solving abilities.

Important Questions for Class 11 Maths Chapter 8 Overview

The Important Questions for Class 11 Maths Chapter 8 are prepared by the subject experts of Physics Wallah provides a detailed overview of key concepts related to Binomial Theorem. These questions are created to help students grasp the fundamental principles of Binomial Theorem and practice the techniques needed to prove mathematical statements.

By solving these questions students can enhance their problem-solving skills and develop a deeper understanding of the chapter which is important for both exams and building a strong foundation in mathematics.

Important Questions for Class 11 Maths Chapter 8 PDF

The Important Questions for Class 11 Maths Chapter 8 PDF which covers key topics from Binomial Theorem is available for download below. This PDF is created to help students practice and master the core concepts of the chapter.

By referring to these questions, students can strengthen their understanding, improve their problem-solving abilities and be better prepared for their exams. The link to download the PDF is provided below for easy access.

Important Questions for Class 11 Maths Chapter 8 PDF

Important Questions for Class 11 Maths Chapter 8 Binomial Theorem

Here is the Important Questions for Class 11 Maths Chapter 8 Binomial Theorem-

Question 1:

Expand the expression $(2x-3)^6$ using the binomial theorem.

Solution:

Given Expression: $(2x-3)^6$

By using the binomial theorem, the expression $(2x-3)^6$ can be expanded as follows:

$(2x-3)^6 = {}^6C_0(2x)^6 - {}^6C_1(2x)^5(3) + {}^6C_2(2x)^4(3)^2 - {}^6C_3(2x)^3(3)^3 + {}^6C_4(2x)^2(3)^4 - {}^6C_5(2x)(3)^5 + {}^6C_6(3)^6$

$(2x-3)^6 = 64x^6 - 6(32x^5)(3) + 15(16x^4)(9) - 20(8x^3)(27) + 15(4x^2)(81) - 6(2x)(243) + 729$

$(2x-3)^6 = 64x^6 - 576x^5 + 2160x^4 - 4320x^3 + 4860x^2 - 2916x + 729$

Thus, the binomial expansion for the given expression $(2x-3)^6$ is $64x^6 - 576x^5 + 2160x^4 - 4320x^3 + 4860x^2 - 2916x + 729$.

Question 2:

Evaluate $(101)^4$ using the binomial theorem

Solution:

Given: $(101)^{4.}$

Here, 101 can be written as the sum or the difference of two numbers, such that the binomial theorem can be applied.

Therefore, 101 = 100+1

Hence, $(101)^4 = (100+1)^4$

Now, by applying the binomial theorem, we get:

$(101)^4 = (100+1)^4 = {}^4C_0(100)^4 + {}^4C_1(100)^3(1) + {}^4C_2(100)^2(1)^2 + {}^4C_3(100)(1)^3 + {}^4C_4(1)^4$

$(101)^4 = (100)^4 + 4(100)^3 + 6(100)^2 + 4(100) + (1)^4$

$(101)^4 = 100000000 + 4000000 + 60000 + 400 + 1$

$(101)^4 = 104060401$

Hence, the value of $(101)^4$ is 104060401.

Question 3:

Using the binomial theorem, show that $6^n - 5n$ always leaves remainder 1 when divided by 25

Solution:

Assume that, for any two numbers, say x and y, we can find numbers q and r such that x = yq + r, then we say that b divides x with q as quotient and r as remainder. Thus, in order to show that $6^n - 5n$ leaves remainder 1 when divided by 25, we should prove that $6^n - 5n = 25k + 1$, where k is some natural number.

We know that,

$(1 + a)^n = {}^nC_0 + {}^nC_1\, a + {}^nC_2\, a^2 + \dots + {}^nC_n\, a^n$

Now for a=5, we get:

$(1 + 5)^n = {}^nC_0 + {}^nC_1\, 5 + {}^nC_2\, (5)^2 + \dots + {}^nC_n\, 5^n$

Now the above form can be weitten as:

$6^n = 1 + 5n + 5^2\, {}^nC_2 + 5^3\, {}^nC_3 + \dots + 5^n$

Now, bring 5n to the L.H.S, we get

$6^n - 5n = 1 + 5^2\, {}^nC_2 + 5^3\, {}^nC_3 + \dots + 5^n$

$6^n - 5n = 1 + 5^2\, ({}^nC_2 + 5\, {}^nC_3 + \dots + 5^{n-2})$

$6^n - 5n = 1 + 25\, ({}^nC_2 + 5\, {}^nC_3 + \dots + 5^{n-2})$

$6^n - 5n = 1 + 25\, k$ (where $k = {}^nC_2 + 5\, {}^nC_3 + \dots + 5^{n-2}$)

The above form proves that, when $6^n - 5n$ is divided by 25, it leaves the remainder 1.

Hence, the given statement is proved.

Question 4:

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

Solution:

For the given condition, the coefficients of $(r - 5)^{th}$ and $(2r - 1)^{th}$ terms of the expansion $(1 + x)^{34}$ are ${}^{34}C_{r-6}$ and ${}^{34}C_{2r-2}$ respectively.

Since the given terms in the expansion are equal,

${}^{34}C_{r-6} = {}^{34}C_{2r-2}$

From this, we can write it as either

$r-6=2r-2$

(or)

r-6=34 -(2r-2) [We know that, if ${}^{n}C_{r} = {}^{n}C_{p}$, then either r = p or r = n – p]

So, we get either r = – 4 or r = 14.

We know that r being a natural number, the value of r = – 4 is not possible.

Hence, the value of r is14.

Benefits of Solving Important Questions for Class 11 Maths Chapter 8

Solving important questions for Class 11 Maths Chapter 8 which focuses on the Binomial Theorem, provide several key benefits for students:

Enhanced Understanding of Concepts: Regular practice of important questions helps in better understanding the core concepts of the Binomial Theorem, such as binomial expansion, binomial coefficients and the application of the theorem in different types of problems.

Improved Problem-Solving Skills: Solving a variety of questions improves analytical and problem-solving abilities. It enables students to apply the theorem in diverse scenarios, making them more adept at tackling exam-style questions.

Faster Calculations: By practicing different types of problems, students become familiar with shortcuts, tricks and techniques that make complex binomial expansions easier and faster to solve.

Preparation for Competitive Exams: Since the Binomial Theorem is a fundamental concept not just for Class 11 exams but also for various competitive exams practicing important questions strengthens a student’s foundation and prepares them for future challenges.

Confidence Boost: As students solve more important questions, they gain confidence in their ability to handle the Binomial Theorem. This self-assurance is crucial for performing well in exams.