

CLASS XI – MATHEMATICS – CHAPTER 08

BINOMIAL THEOREM

Name:

Date:

- Q01.** Which is larger $(1.01)^{10,0000}$ or 10,000
- Q02.** Prove that $\sum_{r=0}^n 3^r {}^n C_r = 4^n$
- Q03.** Using binomial theorem, prove that $6^n - 5^n$ always leaves remainder 1 when divided by 25.
- Q04.** Find the 13th term in the expansion of $[9x - (1/3\sqrt{x})]^{18}$, $x \neq 0$
- Q05.** Find the term independent of x in the expansion of $[\sqrt[3]{x} + (1/2\sqrt[3]{x})]^{18}$, $x > 0$
- Q06.** Find the coefficient of x^5 in the expansion of the product $(1 + 2x)^5(1 - x)^7$
- Q07.** Find n , if the ratio of the fifth term from the beginning to the fifth term from the end in the expansion of $[\sqrt[4]{2} + (1/\sqrt[4]{3})]^n$ is $\sqrt{6} : 1$
- Q08.** The coefficients of three consecutive terms in the expansion of $(1+a)^n$ are in the ratio 1 : 7 : 42. Find n
- Q09.** Compute $(98)^5$
- Q10.** Expand $[x + (1/x)]^6$
- Q11.** Find the fourth term from the end in the expansion of $[(3/x^2) - (x^3/3)]^9$.
- Q12.** Find the middle term of $[2x - (x^2/4)]^9$.
- Q13.** Find the coefficient of a^5b^7 in $(a - 2b)^{12}$.
- Q14.** Find a positive value of m for which the coefficient of x^2 in the expansion $(1 + x)^m$ is 6.
- Q15.** Show that the coefficient of the middle term in the expansion of $(1 + x)^m$ is equal to the sum of the coefficients of two middle terms in the expansion of $(1 + x)^{2n-1}$.
- Q16.** Find a if the coefficient of x^2 and x^3 in the expansion of $(3 + ax)^9$ are equal.
- Q17.** The second, third and fourth terms in the binomial expansion $(x + a)^n$ are 240, 720 and 1080 respectively. Find x , a and n .
- Q18.** If a and b are distinct integers, prove that $a-b$ is a factor of $a^n - b^n$ whenever n is positive.
- Q19.** Find $(a + b)^4 - (a - b)^4$. Hence evaluate $(\sqrt{3} + \sqrt{2})^4 + (\sqrt{3} - \sqrt{2})^4$.
- Q20.** Show that $9^{n+1} - 8n - 9$ is divisible by 64, whenever n is positive integer.
- Q21.** Find the general term in the expansion of $(x^2 - yx)^{12}$.
- Q22.** In the expansion of $(1 + a)^{m+n}$ prove that coefficients of a^m and a^n are equal.
- Q23.** Expand $(1 - x + x^2)^4$.
- Q24.** Find the sixth term of the expansion $[y^{1/2} + x^{1/3}]^n$ if the binomial coefficient of the third term from the end is 45.

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- Q25.** The sum of the coefficients of the first three terms in the expansion of $[x - (3/x^2)]^m$ being natural no. is 559. Find the term of expansion.
- Q26.** Show that the middle term in the expansion of $(1+x)^{2n}$ is $[1.3.5..... (2n-1) 2^n \cdot x^n]/n!$.
- Q27.** What is the middle term in the expansion of $(1+x)^{2n+1}$.
- Q28.** When n is a positive integer, the number of terms in the expansion of $(1+a)^n$ is
- Q29.** Write the general term $(x^2 - y)^6$
- Q30.** In the expansion of $[x + (1/x)]^6$, find the 3rd term from the end.
- Q31.** Expand $(1+x)^n$
- Q32.** Find a if the 17th and 18th terms of the expansion $(2+a)^{50}$ are equal.
- Q33.** Find the term independent of x in the expansion of $[(3x^2/2) - (1/3x)]^6$
- Q34.** In the expansion of $[\sqrt[3]{2} + (1/\sqrt[3]{3})]^n$, the ratio of 7th term from the beginning to the 7th term the end is 1 : 6. Find n
- Q35.** If the coefficient of 5th, 6th and 7th terms in the expansion of $(1+x)^n$ are in A.P, then find the value of n .
- Q36.** Find the number of terms in the expansions of $(1 - 2x + x^2)^7$
- Q37.** Find the coefficients of x^5 in $(x+3)^9$.
- Q38.** Find the term independent of x $[x + (1/x)]^{10}$
- Q39.** Expand $(a+b)^n$
- Q40.** If the coefficients of $(r-5)^{\text{th}}$ and $(2r-1)^{\text{th}}$ terms in the expansion of $(1+x)^{34}$ are equal, find r .
- Q41.** Show that the coefficient of the middle term in the expansion of $(1+x)^{2n}$ is equal to the sum of the coefficients of two middle terms in the expansion of $(1+x)^{2n-1}$
- Q42.** Find the value of, r if the coefficient of $(2r+4)^{\text{th}}$ and $(r-2)^{\text{th}}$ terms in the expansion of $1+(+x)^{18}$ are equal.
- Q43.** If P be the sum of odd terms and Q that of even terms in the expansion of $(1+a)^n$ prove that
- (a) $P^2 - Q^2 = (x^2 - a^2)^n$
 - (b) $4PQ = (x+a)^{2n} - (x-a)^{2n}$
 - (c) $2(P^2 + Q^2) = [(x+a)^{2n} + (x-a)^{2n}]$
- Q44.** If three successive coefficient In the expansion of $(1+x)^n$ are 220, 495 and 792 then, find n .