

Important Questions 2010
Class-XII- Maths
Binomial Theorem

Q.1. Find $(x+1)^6 + (x-1)^6$. Hence, Evaluate $(\sqrt{2}+1)^6 + (\sqrt{2}-1)^6$.

Q.2. Show that $9n+1 - 8n - 9$ is divisible by 64.

Q.3. Find a if the 17th and 18th terms of the expansion of $(2+a)^{50}$ are equal.

Q.4. Find the middle term in the expansion of $(1+x)^{2n}$, where n is a positive integer.

Q. 5. Find a positive value of m for which the coefficient of x^2 in the expansion of $(1+x)^m$ is 6.

Q.6. Find the middle terms in the expansions of $\left(3 - \frac{x^3}{6}\right)^7$.

Q.7. Find the term independent of x in the expansion of

$$\left(\sqrt[3]{x} + \frac{1}{2\sqrt[3]{x}}\right)^{18}, x > 0$$

Q.8. Find the coefficient of x^5 in the product $(1+2x)^6 (1-x)^7$ using binomial theorem.

Q.9. Find the rth term from the end in the expansion of $(x+a)^n$.

Q.10. Find the expansion of $(3x^2 - 2ax + 3a^2)^3$ using binomial theorem.

Q.11. In the expansion of $(1+a)^{m+n}$, prove that coefficients of a^m and a^n are equal.

Q.12. The second, third and fourth terms in the binomial expansion of $(x+a)^n$ are 240, 720 and 1080 respectively. Find x, a and n.

Q.13. 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 $n^2 - n(4r+1) + 4r^2 - 2 = 0$.

Q.14. The coefficients of the $(r-1)$ th, rth and $(r+1)$ th terms in the expansions of $(x+1)^n$ are in the ratio of 1 : 3 : 5. Find n and r.

Q.15. Find n if the ratio of the 5th term from the beginning to the 5th term from the end in the expansion of $\left(\sqrt[4]{2} + \frac{1}{\sqrt[4]{3}}\right)^n$ is $\sqrt{6} : 1$.

Q.16. Evaluate :

$$\sum_{k=1}^n (2+3^k)$$

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Q.17. Find the value of a so that the term independent of x in the expansion of

$$\left[\sqrt{x} + \frac{a}{x^2} \right]^{10} \text{ is } 405$$

Q.18. Find the 11th term from the end in the expansion of

$$\left(2x - \frac{1}{x^2} \right)^{25}$$