MATHS

BOOKS - NCERT MATHS (HINGLISH)

BINOMIAL THEOREM

Shrot Answer Type Question

1. Find the term independent of x, where $x \neq 0$, in the expansion of $\left(\frac{3x^2}{2} - \frac{1}{3x}\right)^{15}$.

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2. If the term free from x in the expansion of $\left(\sqrt{x}-\frac{k}{x^2}\right)^{10}$ is 405, find the value of k.

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3. Find the coefficient of x in the expansion of $(1-3x+7x^2)(1-x)^{16}$.

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4. Find the term independent of x in the expansion of $\left(3x - \frac{2}{x^2}\right)^{15}$.

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5. Find the middle term (terms) in the expansion of

(i) $\left(\frac{x}{a} - \frac{a}{x}\right)^{10}$ (ii) $\left(3x - \frac{x^3}{6}\right)^{9}$

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6. Find the coefficient of x^{15} in the expansion of $\left(x - x^2\right)^{10}$

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7. The coefficient of x^{-17} in the expansion of $\left(x^4 - \frac{1}{x^3}\right)^{15}$ is

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8. Find the sixth term in the expansion $\left(y^{\frac{1}{2}}+x^{\frac{1}{3}}\right)^{n}$, if the binomial coefficient of the third term of the end is 45.

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9. (2) If the coefficients of (2r + 4)th, (r - 2)th terms in the expansion of $(1+x)^{18}$ are equal, find r.

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10. If the coefficient of 2nd, 3rd and 4th terms in the expansion of $(1+x)^{2n}$ are in A.P. , show that $2n^2 - 9n + 7 = 0$.

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11. Find the coefficient of x^4 in the expansion of $\left(1 + x + x^2 + x^3\right)^{11}$.

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Long Answer Type Question

1. If p is a real number and the middle term in the expansion of $\left(\frac{p}{2}+2\right)^8$ is 1120, then find the value of p.

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2. Show that the middle term in the expansion $\left(x-\frac{1}{x}\right)^{2n}$ is $\frac{1.3.5(2n-1)}{n}(-2)^n$.

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3. If the seventh term from the beginning and end in the binomial expansion of $\left(23+\frac{1}{33}\right)^n$, are equal, find n.

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4. If o be the sum of odd terms and E that of even terms in the expansion of $(x+a)^n$ prove that:

$$O^2-E^2=\left(x^2-a^2\right)^n \quad \text{(ii)}$$

$$4OE=(x+a)^{2n}-(x-a)^{2n} \quad \text{(iii)}$$

$$2\left(O^2+E^2\right)=(x+a)^{2n}+(x-a)^{2n}$$

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5. If x^p occurs in the expansion of $\left(x^2+1/x\right)^{2n}$, prove that its coefficient is $\frac{(2n)!}{\left[\frac{1}{3}(4n-p)\right]!\left[\frac{1}{3}(2n+p)\right]!}$.

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6. Find the term independent of x in the expansion of $\left(1+x+2x^3\right)\left[\left(3x^2/2\right)-(1/3)\right]^9$

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Objective Type Question

1. The number of terms in the expansion of $(x+a)^{100}+(x-a)^{100}$ after simplification

A. 50

B. 202

C. 51

D. None of these

Answer: C

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2. Given positive integers $r > 1, n > 2, n$ being even and the coefficient of $(3r)th$ term and $(r+2)th$ term in the expansion of $(1+x)^{2n}$ are equal; find r

A. $r = \frac{n}{2}$

B. $n = 3r$

C. $n = 2r + 1$

D. None of these

Answer: A

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3. The two successive terms in the expansion of $(1+x)^{24}$ whose coefficients are in the ratio 1:4 are

A. 3rd and 4th

B. 4th and 5th

C. 5th and 6th

D. 6th and 7th

Answer: C

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4. Prove that the coefficient of x^n in the expansion of $(1+x)^{2n}$ is twice the coefficient of x^n in the expansion of $(1+x)^{2n-1}$

A. $1:2$

B. $1:3$

C. $3:1$

D. $2:1$

Answer:

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5. If the coefficients of 2nd, 3rd and 4th terms in the expansion of $(1+x)^n$ are in A.P., then find the value of n.

A. 2

B. 7

C. 11

D. 14

Answer: B

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6. If A and B are the coefficients of x^n in the expansion $(1+x)^{2n}$ and $(1+x)^{2n-1}$ respectively, then

A. 1

B. 2

C. $\frac{1}{2}$

D. $\frac{1}{n}$

Answer: B

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7. If the middle term in the binomial expansion of $\left(\frac{1}{x} + x\sin x^{10}\right)$ is equal to $\frac{63}{8}$, find the

value of x.

A. $2n\pi + \frac{\pi}{6}$

B. $n\pi + \frac{\pi}{6}$

C. $n\pi + (-1)^n \frac{\pi}{6}$

D. $n\pi + (-1)^n \frac{\pi}{3}$

Answer: C

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8. The largest coefficient in the expansion of $(1+x)^{30}$ is.....

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9. The number of terms in the expansion of $(a+b+c)^n, where n \in N.$

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10. In the expansion of $\left(x^2 - \frac{1}{x^2}\right)^{16}$, the value of constant term is.....

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11. If the seventh term from the beginning and end in the binomial expansion of $\left(23 + \frac{1}{33}\right)^n$, are equal, find n.

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12. The coefficient of $a^{-6}b^4$ in the expansion of $\left(\frac{1}{a}-\frac{2b}{3}\right)^{10}$ is.....

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13. Middle term in the expansion of $(a^3+ba)^{28}$ is .....

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14. If $pandq$ are ositive, then prove that the coefficients of $x^{p}andx^{q}$ in the expansion of $(1+x)^{p+q}$ will be equal.

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15. The position of the term independent of x in the expansion of $\left(\sqrt{\frac{x}{3}}+\frac{3}{2x^{2}}\right)^{10}$ is .....

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16. If 25^{15} is divided by 13, then the remainder is .....

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True False

1. The sum of the series $\Sigma_{r=0}^{10}{}^{20}C_r$ is $2^{19}+\frac{{}^{20}C_{10}}{2}$

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2. $7^9 + 9^7$ is divisible by (A) 16 (B) 24 (C) 64 (D) 72

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3. The number of term in the expansion of $\left[(2x + 3y)^4\right]^7$ is 8

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4. Find the sum of the coefficient of to middle terms in the binomial expansion of $(1+x)^{2n-1}$

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5. Write last two digits of the number 3^{400}.

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6. If the expansion of $\left(x - \frac{1}{x^2}\right)^{2n}$ contains a term independent of x, then n is a multiple of 2.

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7. The number of term is the expansion of $(a+b)^n$, where $n \in N$, is one less than the power n

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