MATHS

BOOKS - KUMAR PRAKASHAN KENDRA MATHS (GUJRATI ENGLISH)

BINOMIAL THEOREM

Exercise 8 1

1. Expand the expression

$(1-2x)^5$

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2. Expand the expression

$$\left(\frac{2}{x} - \frac{x}{2}\right)^5$$

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3. Expand the expression

$$(2x - 3)^6$$

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4. Expand the expression

$$\left(\frac{x}{3} + \frac{1}{x}\right)^5$$

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5. Expand the expression

$$\left(x+\frac{1}{x}\right)^{6}$$

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6. Using binomial theorem, evaluate : $(96)^{3}$

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7. Using binomial theorem ,Evaluate each of the following

$(102)^{5}$

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8. Using binomial theorem, evaluate $(101)^{4}$

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9. Using binomial theorem, evaluate $(99)^5$

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10. Using Binomial Theorem, indicate which number is larger $(1.1)^{10000}$ or 1000.

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11. Find $(a+b)^4$ - $(a-b)^4$. Hence, evaluate $\left(\sqrt{3}+\sqrt{2}\right)^4$ - $\left(\sqrt{3}-\sqrt{2}\right)^4$.

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12. Find $(x+1)^6 + (x-1)^6$. Hence or otherwise evaluate $(\sqrt{2}+1)^6 + (\sqrt{2}-1)^6$.

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13. Show that 9^{n+1} - 8n - 9 is divisible by 64, whenever n is a positive interger.

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14. Prove that $\sum_{r=0}^{n} 3^r n C_r = 4^n$.

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Exercise 8 2

1. Find the coefficient of x^5 in$(x+3)^8$

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2. Find the coefficient of a^5b^7 in $(a-2b)^{12}$.

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3. Write the general term in the expansion of $(x^2-y)^6$

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4. Write the general term in the expansion of $(x^2 - yx)^{12}. x \neq 0.$

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5. Find the $4^t h$ term in the expansion of $(x - 2y)^{12}$.

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6. Find the$13t^t h$ term in the expansion of $\left(9x - \frac{1}{3}\sqrt{x}\right)^{18}$,

x !=0.

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

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8. Find the middle terms in the expansions of $\left(\frac{x}{3} + 9Y\right)^{10}$.

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

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10. The coeffcients of the $(r-1)^t h$, $r^t h$ and $(r+1)^t h$ terms in the expansion of $(x+1)^n$ are in the ration 1 : 3: 5 Find n and r.

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11. 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 $(1+x)^{2n-1}$.

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

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Miscellaneous Exercise 8

1. Find a,b and n in the exapnsion of $(a+b)^n$ if the first three terms of the expansion are 729 , 7290 and 30375 , respectively .

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2. Find a if the coefficients of x^2 and x^3 in the expansion of $3+ax)^9$ are equal.

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3. Find the confficient of x^5 in the product $(1+2x)^6$ $(1-x)^7$ using binomial theoram.

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4. If a and b are distinct integers, prove that a-b is a factor of a^n - b^n , whenever n is a positive integer.

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5. Evaluate : $\left(\sqrt{3}+\sqrt{2}\right)^6-\left(\sqrt{3}-\sqrt{2}\right)^6$

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6. Find the value of $(a^2+\sqrt{a^2-1})^4+(a^2-\sqrt{a^2-1})^4$.

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7. Find an approximation of $(0.99)^5$ using the first three terms of its expansion.

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8. Find n, if the ratio of the fifth term from beginning to the fifth term from the end in the expansion of $\left(\sqrt[4]{2}+\frac{1}{\sqrt[4]{3}}\right)^n$ id $\sqrt{6}:1$.

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9. Expand using Binomial Theorem $\left(1+\frac{x}{2}-\frac{2}{x}\right)^4$, x!= 0.

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

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Practice Work

1. Expand the following expressions :

$(2x+3y)^5$

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2. Expand the following expressions :

$$\left(x - \frac{1}{2x}\right)^5$$

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3. Expand the following expressions :

$$\left(ax - \frac{b}{x}\right)^6$$

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4. Expand the following expressions :

$$\left(1 - x + x^2\right)^4$$

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5. Expand using Binomial Theorem $\left(1+\frac{x}{2}-\frac{2}{x}\right)^4$, x!= 0.

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6. Expand the following expressions :

$(1-2x+x^2)^3$

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7. Expand the following expressions :

$(1-2x+x^2)^3$

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8. Find the number of terms in the expansion of the following :

$\left(x+\frac{y}{x}\right)^{7}$

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9. Find the number of terms in the expansion of the following :

$\left(x^{2}+1-2x\right)^{8}$

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10. Find the number of terms in the expansion of the following :

$(x+2a)^{10}+(x-2a)^{10}$

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11. Find the number of terms in the expansion of the following :

$\left(2x+\frac{1}{y}\right)^{7}+\left(2x-\frac{1}{y}\right)^{7}$

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12. Find the number of terms in the expansion of the following :

$(z+3y)^{8}-(z-3y)^{8}$

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13. Find the number of terms in the expansion of the following :

$(2a+5b)^9-(2a-5b)^9$

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14. Using binomial theorem , Evaluate the following :

$(0.99)^5$

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15. Using binomial theorem ,Evaluate each of the following

$(101)^4$

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16. Using binomial theorem , Evaluate the following :

$(98)^5$

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17. Find $(x+y)^5+(x-y)^5$. Hence evaluate $(\sqrt{2}+1)^5+(\sqrt{2}-1)^5$

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18. Using binomial theorem , Prove that $2^{3n}-7n-1$ is divisible by 49.

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19. Using binomial theorem ,Prove that $3^{3n} - 26n - 1$ is divisible by 676.

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20. Using binomial theorem , Prove that $a^n - b^n$ is divisible by $(a - b)$

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21. Prove that , $(101)^{50} > 100^{50} + 99^{50}$

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22. Evaluate : $(1.01)^{10} + (1 - 0.01)^{10}$

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23. Find the coefficient of :

$x^4 \text{ in } (2x + 5)^8$

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24. Find the coefficient of :

$y^5 \text{ in } \left(3y^2 + \frac{1}{3y}\right)^{10}$

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25. Find the coefficient of :

x^{10} in $\left(x^2-2\right)^{11}$

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26. Find the coefficient of :

x^{40} in $\left(1^2+2x\right)^{20}$

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27. Find the coefficient of :

x^{11} in $\left(x^3-\frac{2}{x^2}\right)^{12}$

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28. Find the general term in the expansion of

$(5x - 3)^{12}$

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29. Find the general term in the expansion of

$\left(z^2 - \frac{3}{z^2}\right)^{35}$

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30. Find the general term in the expansion of

$(x + 3y)^{10}$

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31. Find the general term in the expansion of

$$(y^2 + 6y + 9)^{20}$$

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32. Find the general term in the expansion of

$$(3y + 6z)^9$$

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33. Find the 6^{th} term in expansion of $\left(\frac{x^3}{2} - \frac{2}{x^2}\right)^9$

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34. Find the 7^{th} term in the expansion of $(x+3y)^8$

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35. Find the 7^{th} term in the expansion of $\left(3x-\frac{2y}{3}\right)^{10}$

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36. Find the 6^{th} term in expansion of $\left(z^2+\frac{2z}{3}+\frac{1}{9}\right)^5$

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37. Find the middle term in expansion of :

$(2x+3y)^9$

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38. Find the middle term in expansion of :

$\left(\frac{a}{x}+bx\right)^{12}$

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39. Find the middle term in expansion of :

$\left(x^2+a^2\right)^5$

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40. Find the middle term in expansion of :

$\left(1-2x+x^2\right)^n$

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41. Find the middle term in expansion of :

$$\left(2ax - \frac{b}{x^2}\right)^{12}$$

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42. If the coefficients of 4^{th} and 13^{th} terms in the expansion of $(a+b)^n$ are equal then find n .

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43. If 4^{th} term of $\left(ax + \frac{1}{x}\right)^n$ is $\frac{5}{2}$ then find a and n .

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44. Prove that there is no term involving x^6 in the expansion of $\left(2x^2 - \frac{3}{x}\right)^{11}, (x \neq 0)$

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45. Find the constant term of $\left(3x^2 - \frac{1}{2x^3}\right)^{10}$

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46. The coefficients of three consecutive terms in the expansion of $(1 + a)^n$ are are in the ratio 1: 7: 42 Find n.

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47. Find the$13t^th$ term in the expansion of $\left(9x - \frac{1}{3}\sqrt{x}\right)^{18}$, x !=0.

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48. The sum of the coefficients of the first three terms in the expansion of $\left(x - \frac{3}{x^2}\right)^m$, x != 0. m being a natural number, is 559. Find the term of the expansion containing x^3.

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49. If the coefficient of x^7 in the expansion of $\left(ax^2 + \frac{1}{bx}\right)^{11}$ is equal to the coefficient of x^{-7} in the

expansion of $\left(ax - \frac{1}{bx^2}\right)^{11}$ are equal then prove that ab = 1 .

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50. 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.

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51. The 3rd , 4th and 5th terms in the expansion of $(x + a)^n$ are respectively 84,280 and 560, find the values of x, a and n .

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52. How many terms are free from radical signs in the expansion of $\left(x^{\frac{1}{5}}+y^{\frac{1}{10}}\right)^{55}$.

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53. Find the coefficient of a^4 in the product $(1+2a)^4(2-a)^5$ using binomial theorem .

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54. $\binom{n}{1}+\binom{n}{2}+\binom{n}{3}+\ldots\ldots\ldots+\binom{n}{n-1}=$ ..... .

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55. Prove that $(2+\sqrt{3})^7+(2-\sqrt{3})^7=10084$ Hence show that $10083<(2+\sqrt{3})^7<10084$.

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56. Show that the ratio of the coefficient of x^{10} in $(1-x^2)$ and the term independent of x in $\left(x-\frac{2}{x}\right)^{10}$ is $1:32$

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

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

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Textbook Based Mcqs

1. If the middle term in $(a+b)^{10}$ is T_{r-1} then r = ...

A. 6

B. 5

C. 7

D. 8

Answer: C

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2. The constant term in the expansion of $\left(2x^2 - \frac{1}{x}\right)^{12}$ is

. . . . . .

A. 7290

B. 495

C. -7920

D. -495

Answer: A

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3. The coefficient of the x^{21} in the expansion of $\left(x+x^2\right)^{20}$ is .....

A. $\begin{pmatrix} 20 \\ 1 \end{pmatrix}$

B. $\begin{pmatrix} 20 \\ 0 \end{pmatrix}$

C. $\begin{pmatrix} 20 \\ 2 \end{pmatrix}$

D. $\begin{pmatrix} 20 \\ 12 \end{pmatrix}$

Answer: A

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4. The value of $\left(\sqrt{5}+1\right)^5-\left(\sqrt{5}-1\right)^5$ is .....

A. 252

B. 352

C. 452

D. 532

Answer: B

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5. $(1+x)^{10} = a_0 + a_1 x + a_2 x^2 + \ldots\ldots\ldots + a_{10} x^{10}$ then the value of $(a_0 - a_2 + a_4 - a_6 + a_8 - a_{10})^2 + (a_1 - a_3 + a_5 - a_7 + a_9)^2$ is .....

A. 3^{10}

B. 2^{10}

C. 2^9

D. 0

Answer: B

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6. The sum of the coefficient in the expansion $\left(1+x-3x^2\right)^{4331}$ is .....

A. 1

B. -1

C. 0

D. 2^{4330}

Answer: B

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7. In the expansion of $\left(2\sqrt{2}+\sqrt[4]{7}\right)^{100}$ the number of the term free from radical sign is . . . . . .

A. 24

B. 26

C. 28

D. 0

Answer: B

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8. Dividing 5^{99} by 13 , the remainder is . . . . . .

A. 8

B. 9

C. 10

D. 0

Answer: A

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9. $9^7 + 7^9$ is divisible by . . . . . .

A. 6

B. 24

C. 64

D. 72

Answer: C

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10. $\sum_{r=0}^{n} .^{n} C_r 4^r = \ldots\ldots\ldots$

A. 4^n

B. 5^n

C. 5^{-n}

D. 4^{-n}

Answer: B

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11. If $\left(1+2x-3x^2\right)^5 = 1+a_1x+a_2x^2+\ldots.+a_{10}x^{10}$ then the value of $a_2+a_4+\ldots..+a_{10}$ is $\ldots\ldots\ldots$

A. 1024

B. 511

C. -511

D. 31

Answer: C

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12. $(2+\sqrt{3})^4+(2-\sqrt{3})^4=x+y\sqrt{3}$ then y = ...

A. 0

B. 56

C. 112

D. 97

Answer: A

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13. In the expansion of $(1+x)^n$ if the coefficients of the terms 5^{th} and 19^{th} are equal then n = ...

A. 18

B. 24

C. 22

D. 20

Answer: C

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14. The constant term in the expansion of $\left(x - \frac{1}{3x^2}\right)^9$ is the . . . . . term .

A. T_3

B. T_4

C. T_5

D. None of these

Answer: B

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15. In the expansion of $(1+x)^{21}+(1+x)^{22}+\ldots\ldots+(1+x)^{30}$, the coefficient of x^5 is $\ldots\ldots$.

A. $51C_5$

B. $9C_5$

C. $31C_6-21C_6$

D. $30C_5-20C_5$

Answer: C

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16. In the expansion of $(x+a)^{100}+(x-a)^{100}$, there are ..... terms

A. 202

B. 51

C. 50

D. None of these

Answer: B

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17. The middle term in the expansion $\left(x^2 - \frac{1}{2x}\right)^{20}$ is r than $(r+3)^{th}$ term is .....

A. $20C_{14}\left(\frac{x}{2^{14}}\right)$

B. $20C_{12}x^2 2^{-12}$

C. $-20C_7 x.2^{-13}$

D. None of these

Answer: C

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18. In the expansion of $\left(x^4 - \frac{1}{x^3}\right)^{15}$ if in the r^{th} temr , there is x^{-17} then r .....

A. 10

B. 11

C. 12

D. 13

Answer: C

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19. If 5^{th}, 6^{th} and 7^{th} terms in the expansion of $(1+y)^n$ are in A.P . Then the value of n is . . . . . .

A. 7,11

B. 7,14

C. 8,16

D. None of these

Answer: B

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20. If in the expansion of $(a+b)^n$, $\frac{T_2}{T_3}$ is equal to $\frac{T_3}{T_4}$ in the expansion of $(a+b)^{n+3}$ then n = ...

A. 3

B. 4

C. 5

D. 6

Answer: C

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21. The constant term in the expansion of $\left(\frac{1}{2}x^{\frac{1}{3}} + x^{-\frac{1}{5}}\right)^8$ is . . . . . term .

A. T_5

B. T_6

C. T_7

D. T_8

Answer: B

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22. The coeficient of $\left(x^7 y^3\right)$ in

the expansion of $(x-y)^{10}$ –

the coefficient of $\left(x^3 y^7\right)$ in

the expansion of $(x-y)^{10}$ is .....

A. $10C_7$

B. $210C_7$

C. $10C_7 + 10C_1$

D. 0

Answer: D

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23. $\left[(\sqrt{3}+1)^6\right] = \ldots\ldots\ldots$

Where $[\ ]$ is a greatest integar function .

A. 415

B. 416

C. 417

D. 418

Answer: A

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24. $10C_1 + 10C_3 + 10C_5 + 10C_7 + 10C_9 = \ldots\ldots$

A. 2^9

B. 2^{10}

C. 2^{10-1}

D. None of these

Answer: A

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25. $\left(1+x-2x^2\right)^6 = 1 + a_1, x + a_2x^2 + \ldots. + a_{12}^{12}$ then the value of $a_2 + a_4 + a_6 + \ldots. + a_{12} = \ldots\ldots\ldots$

A. 32

B. 63

C. 64

D. 31

Answer: D

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26. In the expansion of $\left(1+x^2\right)^5(1+x)^4$, the coefficient of x^5 is .....

A. 30

B. 60

C. 40

D. None of thee

Answer: B

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27. In the expansion of $(a+b)^n$, the sum of the coefficient of x^5 is . . . . . .

A. 1594

B. 792

C. 924

D. 2924

Answer: C

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28. The coefficient of x in expansion of $\left(x^2+\frac{a}{x}\right)^5$ is . . . . . .

A. $9a^2$

B. $10a^3$

C. $10a^2$

D. 0.41666666666667

Answer: B

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29. The number of the terms in the expansion $\left(\sqrt{3}+\sqrt[5]{5}\right)^{256}$ which are integar is .....

A. 33

B. 34

C. 35

D. 32

Answer: A

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30. If the 3^{rd} term in expansion $\left(x + x^{\log 10^x}\right)^5$ is 10^6 then the value of x is . . . . . .

A. 10

B. 11

C. 12

D. 20

Answer: A

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Latest Exam Mcqs

1. In the expansion of $\left(x+\sqrt{x^3-1}\right)^5+\left(x-\sqrt{x^3-1}\right)^5$ the sum of coefficients of all terms having odd exponent is .....

A. -1

B. 0

C. 1

D. 2

Answer: D

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Textbook Illustrations For Practice Work

1. Expand $\left(X^2 + \frac{3}{x}\right)^4$, x != 0

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2. Using binomial theorem , Evaluate the following :

$(98)^5$

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3. Which is larger $(1.01)^{1000000}$ or 10,000?

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4. Using binomial theorem. Prove that 6^n-5n always leaves remainder 1 when divided by 25.

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

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6. Show that the middle term in the expansion of $(1+x)^2 n$ is 1.3.5...(2n-1)/n! $2n.\ x^n$, where n is a positive integer.

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7. Find the coefficient of $x^6\ y^3$ in the expansion of $(x+2y)^9$

.

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

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9. The coefficients of three consecutive terms in the expansion of $(1+a)^n$ are are in the ratio 1: 7: 42 Find n.

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10. Find the term independent of x in the expansion of $\left(\frac{3}{2}x^2 - \frac{1}{3x}\right)^6$.

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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.

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12. Find the coefficient of a^4 in the product $(1 + 2a)^4(2 - a)^5$ using binomial theorem .

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13. Find the $r^t h$ term from the end in the expansion of $(x+a)^n$.

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14. in the expansion of $\left(\sqrt[3]{x}+\frac{1}{2\sqrt[3]{x}}\right)^{18}, x>0$

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15. The sum of the coefficients of the first three terms in the expansion of $\left(x-\frac{3}{x^2}\right)^m$, x != 0. m being a natural number, is 559. Find the term of the expansion containing x^3.

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

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Solution Of Ncert Exemplar Problems Short Answer Type Questions

1. Find the term independent of x in the expansion of $\left(\frac{3}{2}x^2 - \frac{1}{3x}\right)^6$.

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

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

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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

$$\left(\frac{x}{a} = \frac{a}{x}\right)^{10}$$

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

$$\left(3x - \frac{x^3}{6}\right)^9$$

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

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

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

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10. Find the value of r , if the coefficients of $(2r+4)th$ and $(r-2)$ th terms in the expansion of $(1+x)^{18}$ are equal .

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11. If the coefficient of second , third and fourth terns in the expansion of $(1+x)^{2n}$ are in AP, then show that $2n^2 - 9n + 7 = 0$

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

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Solution Of Ncert Exemplar Problems Long Answer Type Questions

1. If p is 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 of $\left(x-\frac{1}{x}\right)^{2n}$ is $\frac{1\times 3\times 5\times \ldots .\times (2n-1)}{n!}\times (-2)^n$

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3. Find n in the Binomial $\left(\sqrt[3]{2}+\frac{1}{\sqrt[3]{3}}\right)^n$, if the ratio of 7th term from the beginning to the 7th term from the end is $\frac{1}{6}$.

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4. In the expansion $(x+a)^n$, if the sum of odd terms is denoted by O and the sum of even term by E . Then ,prove that

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

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5. In the expansion $(x+a)^n$, if the sum of odd terms is denoted by O and the um of even term by E . Then ,prove that

$4OE = (x+a)^{2n} - (x-a)^{2n}$

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

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7. Find the term independent of x in the expansion of $(1+x+2x^3)\left(\frac{3}{2}x^2-\frac{1}{3x}\right)^9$

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Solution Of Ncert Exemplar Problems Objective Type Questions

1. In the expansion of $(x+a)^{100}+(x-a)^{100}$, there are ..... terms

A. 50

B. 202

C. 51

D. None of these

Answer: C

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2. If the integers $r>1, n>2$ and coefficients of (3)th and $(r+2)$ nd terms in the Binomial expansion of $(1+x)^{2n}$ are equal ,then

A. n = 2r

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: D

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5. If the coefficient of 2nd , 3rd and the 4th terms in the expansion of $(1+x)^n$ are in AP, then the value of n is

A. 2

B. 7

C. 11

D. 14

Answer: B

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6. If A and B are coefficient of x^n in the expansions of $(1+x)^{2n}$ and $(1+x)^{2n-1}$ respectively , then $\frac{A}{B}$ equals to

A. 1

B. 2

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

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

Answer: B

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7. If the middle term of $\left(\frac{1}{x}+x\in x\right)^{10}$ is equal to 7. $\frac{7}{8}$, then the value of x is .

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

B. $n\pi + \frac{\pi}{6}, n \in Z$

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

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

Answer: C

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Solution Of Ncert Exemplar Problems Fillers

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

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2. The number of terms in the expansion of $(x+y+z)^n$.....

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

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

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5. 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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6. Middle term in the expansion of $\left(a^3+ba\right)^{28}$ is .....

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7. The coefficient of x^m and x^n in the expansion of $(1+x)^{m+n}$ are .....

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8. The term 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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9. If $(25)^{15}$ is divided by 13 , then the remainder is .....

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Solution Of Ncert Exemplar Problems True False

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

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2. $9^7 + 7^9$ is divisible by . . . . . .

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

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4. The sum of coefficients of the two middle terms in the expansion of $(1 + x)^{2n-1}$ is equal to $(2n - 1)C_n$

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5. The last two digits of the numbers 3^{400} are 01.

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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. Sum of the power of a and b in expansion $(a+b)^n$ is n .

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Question Of Module

1. Expand each of expression in 1 to 5 :

$(1-2x)^5$

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2. Find $(a+b)^4$ - $(a-b)^4$. Hence, evaluate $\left(\sqrt{3}+\sqrt{2}\right)^4$ - $\left(\sqrt{3}-\sqrt{2}\right)^4$.

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3. Using binomial theorem. Prove that 6^n-5n always leaves remainder 1 when divided by 25.

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4. Prove that $\sum_{r=0}^{n} 3^r n C_r = 4^n$.

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5. In the expansion $\left(2x^2 + \frac{1}{x}\right)^{10}$, $x \neq 0$ .Find (i) Fifth term (ii) Middle term (iii) If possibe term containing x^9 (iv) If possible term containing x^{-4} (v) If possible constant term .

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

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7. Using binomial theorem , Prove that $a^n - b^n$ is divisible by $(a - b)$

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