FREE NCERT SOLUTIONS

CLASS - 11

BINOMIAL THEOREM

EXERCISE 8.1 - Question No. 1

Expand of the expression : $(1-2x)^5$

EXERCISE 8.1 - Question No. 2

Expand of the expression : $\left(\frac{2}{5}-\frac{x}{2}\right)^5$

EXERCISE 8.1 - Question No. 3

Expand of the expression : $(2x - 3)^6$

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EXERCISE 8.1 - Question No. 4

Expand of the expression : $\left(\frac{x}{3} + \frac{1}{x}\right)^5$

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EXERCISE 8.1 - Question No. 5

Expand of the expression : $\left(x + \frac{1}{x}\right)^6$

EXERCISE 8.1 - Question No. 6

Using binomial theorem, evaluate : $(96)^3$

EXERCISE 8.1 - Question No. 7

Using binomial theorem, evaluate : $(102)^5$

EXERCISE 8.1 - Question No. 8

Using binomial theorem, evaluate : $(101)^4$

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EXERCISE 8.1 - Question No. 9

Using binomial theorem, evaluate : $(99)^5$

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EXERCISE 8.1 - Question No. 10

Using binomial theorem, indicate which number is larger

$(1.1)^{10000}$ or 1000.

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EXERCISE 8.1 - Question No. 11

Find $(a+b)^4-(a-b)^4$. Hence, evaluate

$(\sqrt{3}+\sqrt{2})^4-(\sqrt{3}-\sqrt{2})^4$.

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EXERCISE 8.1 - Question No. 12

Find $(x+1)^6+(x-1)^6$. Hence or otherwise evaluate

$(\sqrt{2}+1)^6+(\sqrt{2}-1)^6$.

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EXERCISE 8.1 - Question No. 13

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

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EXERCISE 8.1 - Question No. 14

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

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EXERCISE 8.2 - Question No. 1

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

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EXERCISE 8.2 - Question No. 2

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

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EXERCISE 8.2 - Question No. 3

Write the general term in the expansion of $\left(x^2-y\right)^6$

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EXERCISE 8.2 - Question No. 4

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

EXERCISE 8.2 - Question No. 5

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

EXERCISE 8.2 - Question No. 6

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

MISCELLANEOUS EXERCISE - Question No. 1

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

MISCELLANEOUS EXERCISE - Question No. 2

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

MISCELLANEOUS EXERCISE - Question No. 3

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

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MISCELLANEOUS EXERCISE - Question No. 4

If 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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MISCELLANEOUS EXERCISE - Question No. 5

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

MISCELLANEOUS EXERCISE - Question No. 6

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

MISCELLANEOUS EXERCISE - Question No. 7

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

MISCELLANEOUS EXERCISE - Question No. 8

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

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MISCELLANEOUS EXERCISE - Question No. 9

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

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MISCELLANEOUS EXERCISE - Question No. 10

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

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SOLVED EXAMPLES - Question No. 1

Expand $\left(x^2+\frac{3}{x}\right)^4, x \neq 0$

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SOLVED EXAMPLES - Question No. 2

Compute $(98)^5$.

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SOLVED EXAMPLES - Question No. 3

Which is larger $(1.01)^{10000000}$ or 10,000?

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SOLVED EXAMPLES - Question No. 4

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

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SOLVED EXAMPLES - Question No. 5

Find a if the 17^{th} and 18^{th} terms of the expansion $(2+1)^{50}$ are equal.

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SOLVED EXAMPLES - Question No. 6

Show that the middle term in the expansion of $(1+x)^{2n}$ is

$\frac{1.3.5.\overset{\vdots}{2n-1}}{n!}\,2nx^n 2nx^n$, where n is a positive integer.

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SOLVED EXAMPLES - Question No. 7

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

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SOLVED EXAMPLES - Question No. 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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SOLVED EXAMPLES - Question No. 9

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

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SOLVED EXAMPLES - Question No. 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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SOLVED EXAMPLES - Question No. 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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SOLVED EXAMPLES - Question No. 12

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

SOLVED EXAMPLES - Question No. 13

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

SOLVED EXAMPLES - Question No. 14

Find the r^{th} term from the end in the expansion of $(x+a)^n$.

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SOLVED EXAMPLES - Question No. 15

Find the term independent of x in the expansion of $\left(x3+\frac{1}{2x3}\right)$

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SOLVED EXAMPLES - Question No. 16

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

SOLVED EXAMPLES - Question No. 17

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