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EXERCISE 8.1 - Question No. 1

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

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EXERCISE 8.1 - Question No. 2

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

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

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EXERCISE 8.1 - Question No. 6

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

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EXERCISE 8.1 - Question No. 7

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

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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 $\sum_{r=0}^n 3^r \binom{n}{r} = 4^n$.

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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 $(x^2 - y)^6$

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EXERCISE 8.2 - Question No. 4

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

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EXERCISE 8.2 - Question No. 5

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

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EXERCISE 8.2 - Question No. 6

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

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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.

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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.

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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 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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MISCELLANEOUS EXERCISE - Question No. 5

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

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MISCELLANEOUS EXERCISE - Question No. 6

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

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MISCELLANEOUS EXERCISE - Question No. 7

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

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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 $(3x^2 - 2ax + 3a^2)^3$ 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

$$\frac{1 \cdot 3 \cdot 5 \cdot \dots \cdot 2n - 1}{n!} 2^n x^n, \text{ where } n \text{ is a positive integer.}$$

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SOLVED EXAMPLES - Question No. 7

Find the coefficient of $x^6 y^3$ 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 $(1 + x)^{2n-1}$.

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SOLVED EXAMPLES - Question No. 13

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

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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 $\left(x^3 + \frac{1}{2x^3}\right)$

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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 .

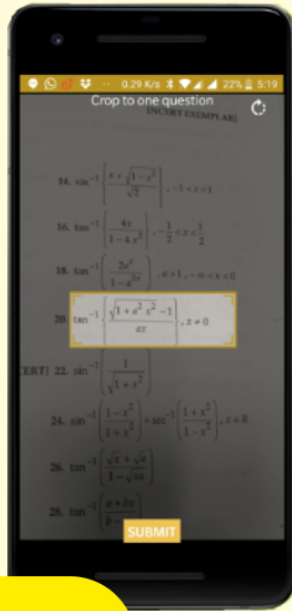
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SOLVED EXAMPLES - Question No. 17

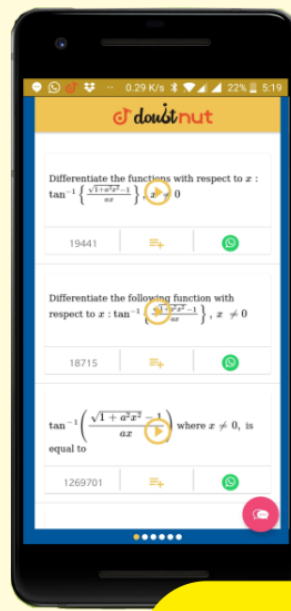
If the coefficients of $(r - 5)^{th}$ and $(2r - 1)^{th}$ terms of the expansion $(1 + x)^{34}$ are equal, find r.

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