MATHS

BOOKS - MAHAVEER PUBLICATION

BINOMIAL THEOREM

Question Bank

1. Expand using Pascal's triangle : $(x+y)^4$

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

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3. Expand $(1.04)^5$ by the binomial theorem and find its value to two decimal places.

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4. Expand the following expression using binomial theorem and write down their

general term.

$$\left(x+\frac{2}{x}\right)^4$$

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5. Expand the following expression using binomial theorem and write down their general term.

$$(x-2)^5$$

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6. In the expansion of $(x+3y)^6$, find the middle term $\left(\frac{6}{2}+1\right)^{th}$ i.e.4^{th} term.

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7. In the expansion of $(2x+3y)^5$, find the middle terms $\left(\frac{5+1}{2}\right)^{th}$ term i.e. 3^{th} term and $\left(\frac{5+1}{2}+1\right)^{th}$ term i.e. $4th$ term.

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8. Find the coefficient of x^{-8} in the expansion of $\left(x - \frac{1}{2x^2}\right)^{10}$

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

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10. Show that the middle term in the expansion of

$(1+x)^{2n} is \frac{(1.3.5(2n-1))}{n!} 2^n x^n, where n$ is a positive integer.

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11. Find the term independent of x in $\left(2x^2 - \frac{1}{x}\right)^{12}$. Also write its 3^{rd} term.

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12. Evaluate : $\left(1+\sqrt{7}\right)^5 + \left(1-\sqrt{7}\right)^5$

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13. Find the middle term in the expansion of :

$$\left(x - \frac{1}{x}\right)^{10}$$

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14. Find the coefficient of a^{15} in the expansion of $\left(a^3 + \frac{2}{a^2}\right)^{10}$

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15. If

$$(1+x)^n = C_0 + C_1 x + C_2 x^2 + \_\ \_\ + C_n x^n,$$

Prove that,

$$C_1 + 2C_2 + 3C_3 + \_\ \_\ + nC_n = n.2^{n-1}.$$

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16. Find the co-efficient of x^{17} in $\left(x - x^2\right)^{10}$.

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17. Find the co-efficient of $\frac{1}{x}$ in the expansion of $\left(\frac{3}{x^2} - \frac{x^3}{3}\right)^8$.

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

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

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

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

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22. Find a if the 7th and 18th terms of the expansion $(2+a)^{50}$ are equal.

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

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

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25. Find middle term of $\left(x + \frac{2}{x^2}\right)^{17}$

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26. Find middle term of

$$\left(x+\frac{2}{x^2}\right)^{16}$$

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27. Find the middle term in the expansion of

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

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28. Find middle term of

$$\left(2x + \frac{1}{x^2}\right)^{18}$$

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29. Show that there are no terms independent of in the expansion of $\left(x + \frac{1}{x}\right)^{19}$

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30. Find the co-efficient of x^4 in the expansion of $\left(2x^2 + \frac{1}{x}\right)^{20}$.

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31. Find the co-efficient of y^4 in $\left(y + \frac{c^3}{y^2}\right)^{10}$.

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32. Write down the 6^{th} term in the expansion of $\left(x^2 - 2x\right)^{10}$.

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33. Find the term of x in the following binomial expansions $(x \neq 0)$: $\left(2x^2 - \frac{1}{x}\right)^{12}$

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

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35. Find the term independent of x in the expansion off the following expression: $\left(2x + \frac{1}{3x^2}\right)^9$

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36. If $(1+x)^n = C_0 + C_1 x + C_2 x^2 + \_\_ + C_n x^n$, prove that $C_1 + 2C_2 + 3C_3 + \_\_ + {}^n C_n = n2^{n-1}$

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