

Binomial and Multinomial

Practice Problems

1. Determine the coefficient of $(a^2 b^4 d)$ in the polynomial expansion $(3a+5b-2c+d)^7$.
2. a) How many distinct terms exist in the expansion of $(x + y + z + t)^{10}$?
b) How many terms are there in the expansion of $(3a+5b-2c+d)^7$?
3. Find the coefficient of $a^3 b^2 c^4 d$ in the expansion of $(a-b-c+d)^{10}$.
4. What is the coefficient of the $a^3 b^2$ in the expansion of $(a + 2b + 3c)^5$?
5. a) Find the third term in the expansion of $(3 + y)^6$.
b) Find the co-efficient of z^4 in the expansion of $(5 + z)^8$.
c) The term containing x^3 in the expansion of $(x - y)^7$ is?
6. In the expansion of $(a + 2a^3)^n$ is the coefficient of the 3rd expansion member greater by 44 than the 2nd member's coefficient. Find out a positive integer meeting these conditions.
7. For which x the 5th term, $M_5 = 105$?

$$\left(\frac{1}{2\sqrt{x}} - \frac{1}{2}\right)^{10}$$

8. If the coefficient of x^7 and x^8 in the expansion of $(2+x/3)^n$ are equal, then find the value of n .

9. If the co-efficient of x^7 in $(ax^2 + \frac{1}{bx})^{11}$ is equal to the co-efficient of x^{-7} in $(ax - \frac{1}{bx^2})^{11}$, then find relation between a and b .

10. Find the co-efficient of x^5 in $(1+x^2)^5 (1+x)^4$.

11. a) Find the term independent of x in the expansion of the following question: $(\frac{3}{2}x^2 - \frac{1}{2x})^6$

b) Find the term independent of x in the expansion of $(\sqrt{\frac{x}{3}} + \frac{\sqrt{3}}{2x^2})^{10}$

12. Find the co-efficient of the x^7 term in the expansion of $(1-2x+x^2)^6$.

13. The output of a machine is graded excellent 60% of the time, good 25% of the time, and defective 15% of the time. What is the probability that a sample size 15 has 10 excellent, 3 good and 2 defective items?

14. The co-efficient of the 3rd term of the expansion $(5x+2)^n$ is 70312500. Find the value of n .

15. Out of a Group of ten residents in a certain country, 3 are Republicans, 5 are Democrats, and 2 are Independents. How many unique partitions of this group of residents are there by political party?

