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Pure Mathematics-1

TOPIC- Binomial-Coefficient &
finding constant

Series-Coefficient & finding constant

01 The coefficient of x^3 in the expansion of $(a+x)^5 + (1-2x)^6$, where a is positive, is 90. Find the value of a . 7-11-12-1 [5]

02 The coefficient of x^3 in the expansion of $(1-3x)^6 + (1+ax)^5$ is 100. Find the value of the constant a . 2-16-13-2 [4]



Series-Coefficient & finding constant

03 The coefficient of x^3 in the expansion of $(a+x)^5 + (2-x)^6$ is 90. Find the value of the positive constant a . ~~J-12-12-3~~ [5]

04 (i) Write down the first 4 terms, in ascending powers of x , of the expansion of $(a-x)^5$. [2]

(ii) The coefficient of x^3 in the expansion of $(1-ax)(a-x)^5$ is -200 . Find the possible values of the constant a . ~~J-15-13-3~~ [4]

Series-Coefficient & finding constant

- 05 (i) Find the first three terms when $(2 + 3x)^6$ is expanded in ascending powers of x . N-13-11-1 [3]
- (ii) In the expansion of $(1 + ax)(2 + 3x)^6$, the coefficient of x^2 is zero. Find the value of a . [2]

- 06 (i) In the expression $(1 - px)^6$, p is a non-zero constant. Find the first three terms when $(1 - px)^6$ is expanded in ascending powers of x . [2]
- (ii) It is given that the coefficient of x^2 in the expansion of $(1 - x)(1 - px)^6$ is zero. Find the value of p . J-13-11-2 [3]

Series-Coefficient & finding constant

- 0.7 (i) Find the first 3 terms in the expansion of $(2 - x)^6$ in ascending powers of x . *N-9-11-3* [3]
- (ii) Given that the coefficient of x^2 in the expansion of $(1 + 2x + ax^2)(2 - x)^6$ is 48, find the value of the constant a . [3]

- 0.8 (i) Find the first three terms in the expansion of $(2 + ax)^5$ in ascending powers of x . [3]
- (ii) Given that the coefficient of x^2 in the expansion of $(1 + 2x)(2 + ax)^5$ is 240, find the possible values of a . *7-13-13-4* [3]

Series-Coefficient & finding constant

- 09 In the expansion of $\left(1 - \frac{2x}{a}\right)(a+x)^5$, where a is a non-zero constant, show that the coefficient of x^2 is zero. N-15-11-1 [3]

- 10 (i) Find the first 3 terms in the expansion of $(2+3x)^5$ in ascending powers of x . [3]
- (ii) Hence find the value of the constant a for which there is no term in x^2 in the expansion of $(1+ax)(2+3x)^5$. [2]

J-9-(3)

Series-Coefficient & finding constant

11

- (i) Find the first 3 terms in the expansion of $(1 + ax)^5$ in ascending powers of x . $J-10-12-6$ [2]
- (ii) Given that there is no term in x in the expansion of $(1 - 2x)(1 + ax)^5$, find the value of the constant a . [2]
- (iii) For this value of a , find the coefficient of x^2 in the expansion of $(1 - 2x)(1 + ax)^5$. [3]

Series-Coefficient & finding constant

12⁵ The first three terms in the expansion of $(1 - 2x)^2(1 + ax)^6$, in ascending powers of x , are $1 - x + bx^2$.
Find the values of the constants a and b .

J-12-13-3

[6]

Series-Coefficient & finding constant

13 The coefficient of x^2 in the expansion of $(k + \frac{1}{3}x)^5$ is 30. Find the value of the constant k . [3]
N-11-13-1

14 In the expansion of $(x + 2k)^7$, where k is a non-zero constant, the coefficients of x^4 and x^5 are equal. Find the value of k . [4]
N-15-12-2

Series-Coefficient & finding constant

- 15 (i) Find the terms in x^2 and x^3 in the expansion of $(1 - \frac{3}{2}x)^6$. $\sqrt{-11-12-2}$ [3]
- (ii) Given that there is no term in x^3 in the expansion of $(k + 2x)(1 - \frac{3}{2}x)^6$, find the value of the constant k . [2]

- 16 (i) Find, in terms of the non-zero constant k , the first 4 terms in the expansion of $(k + x)^8$ in ascending powers of x . $N-9-12-2$ [3]
- (ii) Given that the coefficients of x^2 and x^3 in this expansion are equal, find the value of k . [2]

Series-Coefficient & finding constant

- 17 (i) Find the first 3 terms in the expansion of $(2 - x)^6$ in ascending powers of x . *J-5-4* [3]
- (ii) Find the value of k for which there is no term in x^2 in the expansion of $(1 + kx)(2 - x)^6$. [2]

- 18 (i) Find the first 3 terms, in ascending powers of x , in the expansion of $(1 + x)^5$. [2]
- The coefficient of x^2 in the expansion of $(1 + (px + x^2))^5$ is 95. *N-14-12-3*
- (ii) Use the answer to part (i) to find the value of the positive constant p . [3]

Series-Coefficient & finding constant

- 19 In the expansion of $(3 - 2x)\left(1 + \frac{x}{2}\right)^n$, the coefficient of x is 7. Find the value of the constant n and hence find the coefficient of x^2 .

$$n = 16 \quad 12 - 4$$

[6]

- 20 The first three terms in the expansion of $(2 + ax)^n$, in ascending powers of x , are $32 - 40x + bx^2$. Find the values of the constants n , a and b .

$$76 - 4$$

[5]