

PART 7 PAST EXAMINATION QUESTIONS : BINOMIAL THEOREM

1. Write down and simplify the first three terms of the expansion of $(2-x)^5$ in ascending powers of x . Given that the coefficients of x and x^2 in the expansion of $(1+ax+bx^2)(2-x)^5$ are 16 and 0 respectively, calculate the value of a and of b . (N88/P1/8)
2. (a) Evaluate the coefficient of x^3 in the binomial expansion of $(3-\frac{x}{2})^8$.
 (b) Find the coefficient of x^2 in the expansion of $(2+5x+x^2)(1+x)^7$. (J89/P1/10)
3. Find the first three terms of the expansion, in ascending powers of x , of $(1-5x)^6$. Hence obtain the coefficient of x^2 in the expansion of $(1+3x-2x^2)(1-5x)^6$. (N89/P1/5)
4. Find in its simplest form, the coefficient of x^4 in the expansion of (i) $(1+3x)^6$,
 (ii) $(x^2+\frac{3}{x})^5$. (J90/P1/5)
5. Find the first three terms in the expansion, in descending powers of x , of $(x-\frac{2}{x})^6$. Hence find the coefficient of x^4 in the expansion of $(2+3x^2)(x-\frac{2}{x})^6$. (N90/P1/6)
6. Write down, and simplify, the first three terms of the expansion, in ascending powers of x , of (i) $(1+\frac{3x}{2})^5$, (ii) $(2-x)^5$. Hence, or otherwise, obtain the coefficient of x^2 in the expansion of $(2+2x-\frac{3x^2}{2})^5$. (J91/P1/7)
7. Find, in its simplest form, the coefficient of x^4 in the expansion of (i) $(2+x)^6$, (ii) $(x-\frac{5}{x})^{10}$. (N91/P1/3)
8. Given that the expansion of $(1-3x)^2(1+ax)^8$ in ascending powers of x is $1+10x+bx^2+\dots$, calculate the value of a and of b . (J92/P1/4)
9. Given that the coefficient of x^3 in the expansion of $(a+x)^5+(1-2x)^6$ is -120 , calculate the possible values of a . (N92/P1/3)
10. Write down and simplify the first four terms in the expansion, in ascending powers of x , of $(2-3x)^5$. (J93/P1/4)

1. $32 - 80x + 80x^2$, $a = 3$, $b = 5$
2. (a) -1701 (b) 78
3. $1 - 30x + 375x^2$, 283
4. (i) 1215 (ii) 90
5. $x^6 - 12x^4 + 60x^2$, 156
6. (i) $1 + \frac{15}{2}x + \frac{45}{2}x^2$
(ii) $32 - 80x + 80x^2$; 200
7. (i) 60 (ii) $-15\ 000$
8. $2, 25$
9. ± 2
10. $32 - 240x + 720x^2 - 1080x^3$