

Binomial 2

- 1) (i) Find the first 3 terms of the expansion, in ascending powers of x , of $(1 + 3x)^6$. [2]
(ii) Hence find the coefficient of x^2 in the expansion of $(1 + 3x)^6(1 - 3x - 5x^2)$. [3]
- 2) (a) (i) Write down the first 4 terms, in ascending powers of x , of the expansion of $(1 - 3x)^7$. [3]
(ii) Find the coefficient of x^3 in the expansion of $(5 + 2x)(1 - 3x)^7$. [2]
(b) Find the term which is independent of x in the expansion of $\left(x^2 + \frac{2}{x}\right)^9$. [3]
- 3) Given that the expansion of $(a + x)(1 - 2x)^n$ in ascending powers of x is $3 - 41x + bx^2 + \dots$, find the values of the constants a , n and b . [6]
- 4) The binomial expansion of $(1 + px)^n$, where $n > 0$, in ascending powers of x is
$$1 - 12x + 28p^2x^2 + qx^3 + \dots$$
Find the value of n , of p and of q . [6]
- 5) Given that the coefficient of x^2 in the expansion of $(k + x)\left(2 - \frac{x}{2}\right)^6$ is 84, find the value of the constant k . [6]
- 6) (i) Expand $(1 + x)^5$. [1]
(ii) Hence express $(1 + \sqrt{2})^5$ in the form $a + b\sqrt{2}$, where a and b are integers. [3]
(iii) Obtain the corresponding result for $(1 - \sqrt{2})^5$ and **hence** evaluate $(1 + \sqrt{2})^5 + (1 - \sqrt{2})^5$. [2]
- 7) (i) Find, in ascending powers of x , the first 3 terms in the expansion of $(2 - 3x)^5$. [3]
The first 3 terms in the expansion of $(a + bx)(2 - 3x)^5$ in ascending powers of x are $64 - 192x + cx^2$.
(ii) Find the value of a , of b and of c . [5]
- 8) (i) Find the first four terms, in ascending powers of x , in the expansion of $\left(2 - \frac{x}{2}\right)^6$. [4]
(ii) Find the coefficient of x^3 in the expansion of $(1 + x)^2\left(2 - \frac{x}{2}\right)^6$. [2]