Binomial Expansion
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Answer all Questions   Additional Math

1. (a) In ascending powers of x, find the first three terms in the expansion of $(1+2x)^6$. [3]

   (b) Hence find the coefficient of x^2 in the expansion of $(1+2x)^6(1+2x-3x^7)$. [3]

2. Find the term independent of x in the expansion of $\left(x^4 - \dfrac{1}{x^3}\right)^{13}$. [3]

3. (a) Expand $(2+x)^4 + (2-x)^4$. [3]

   (b) Using the substitution $u = x^2$, solve the equation $(2+x)^4 + (2-x)^4 = 626$. [3]

4. Find, in its simplest form, the coefficient of x^4 in the expansion of:

   (a) $(1+2x)^9$ [2]

   (b) $\left(x + \dfrac{5}{x^2}\right)^{16}$ [2]

5. (a) In ascending powers of x, find the first three terms in the expansion of $(3+2x)^5$. [2]

   (b) In the expansion of $(3+2x)^5(a+bx)^5$, the constant term is 1944 and the coefficient of x^2 is -256. Find the value of a and the value of b. [4]

6. (a) Find the coefficient of x^2 in the expansion of $(3-2x)^7$. [2]

   (b) Find the coefficient of x^2 in the expansion of $(2+x)(3-2x)^2$. [3]

7. (a) Given that n is a positive integer, write down the first 3 terms, in ascending powers of x, in the expansion of $\left(1 - \frac{1}{3}x\right)^n$. [3]

   (b) The coefficient of x^2 in the expansion of $(1+x)\left(1 - \frac{1}{3}x\right)^n$ is $\frac{20}{3}$. Find the value of n. [4]

8. Find the term independent of x in the expansion of $\left(x^3 - \dfrac{2}{x^3}\right)^{10}$. [3]