

Binomial Expansion Exam Questions (from OCR 4722)**Q1, (Jan 2011, Q1)**

- (i) Find and simplify the first three terms, in ascending powers of x , in the binomial expansion of $(1 + 2x)^7$. [3]
- (ii) Hence find the coefficient of x^2 in the expansion of $(2 - 5x)(1 + 2x)^7$. [3]
-

Q2, (Jan 2010, Q3)

- (i) Find and simplify the first four terms in the expansion of $(2 - x)^7$ in ascending powers of x . [4]
- (ii) Hence find the coefficient of w^6 in the expansion of $(2 - \frac{1}{4}w^2)^7$. [2]
-

Q3, (Jun 2010, Q3)

- (i) Find and simplify the first four terms in the binomial expansion of $(1 + \frac{1}{2}x)^{10}$ in ascending powers of x . [4]
- (ii) Hence find the coefficient of x^3 in the expansion of $(3 + 4x + 2x^2)(1 + \frac{1}{2}x)^{10}$. [3]
-

Q4 (Jan 2009, Q7)

In the binomial expansion of $(k + ax)^4$ the coefficient of x^2 is 24.

- (i) Given that a and k are both positive, show that $ak = 2$. [3]
- (ii) Given also that the coefficient of x in the expansion is 128, find the values of a and k . [4]
- (iii) Hence find the coefficient of x^3 in the expansion. [2]
-

Q5, (Jan 2013, Q4)

- (i) Find the binomial expansion of $(2 + x)^5$, simplifying the terms. [4]
- (ii) Hence find the coefficient of y^3 in the expansion of $(2 + 3y + y^2)^5$. [3]
-

Q6, (Jun 2013, Q3)

- (i) Find and simplify the first three terms in the expansion of $(2 + 5x)^6$ in ascending powers of x . [4]
- (ii) In the expansion of $(3 + cx)^2(2 + 5x)^6$, the coefficient of x is 4416. Find the value of c . [3]
-

Q7, (Jun 2014, Q6)

- (i) Find the binomial expansion of $(x^3 + \frac{2}{x^2})^4$, simplifying the terms. [5]
- (ii) Hence find $\int (x^3 + \frac{2}{x^2})^4 dx$. [4]
-

Q8 (Jun 2015, Q4)

- (i) Find and simplify the first three terms in the binomial expansion of $(2 + ax)^6$ in ascending powers of x . [4]
- (ii) In the expansion of $(3 - 5x)(2 + ax)^6$, the coefficient of x is 64. Find the value of a . [3]
-

Q9, (Jun 2016, Q3)

- (i) Find the binomial expansion of $(3 + kx)^3$, simplifying the terms. [4]
- (ii) It is given that, in the expansion of $(3 + kx)^3$, the coefficient of x^2 is equal to the constant term. Find the possible values of k , giving your answers in an exact form. [2]
-

Q10, (Jan 2008, Q10)

- (i) Find the binomial expansion of $(2x + 5)^4$, simplifying the terms. [4]
- (ii) Hence show that $(2x + 5)^4 - (2x - 5)^4$ can be written as

$$320x^3 + kx,$$

where the value of the constant k is to be stated. [2]

- (iii) Verify that $x = 2$ is a root of the equation

$$(2x + 5)^4 - (2x - 5)^4 = 3680x - 800,$$

and find the other possible values of x . [6]
