

Year 12 Pure Extension Questions - Binomial Expansion

Q1.

(a) Find the first 3 terms, in ascending powers of x , of the binomial expansion of $(2 - 3x)^6$ giving each term in its simplest form.

(4)

(b) Hence, or otherwise, find the first 3 terms, in ascending powers of x , of the expansion of

$$\left(1 + \frac{x}{2}\right)(2 - 3x)^6$$

(3)

(Total 7 marks)

Q2.

(a) Find the first 3 terms, in ascending powers of x , of the binomial expansion of

$$\left(2 - \frac{x}{16}\right)^9$$

giving each term in its simplest form.

(4)

$$f(x) = (a + bx)\left(2 - \frac{x}{16}\right)^9, \text{ where } a \text{ and } b \text{ are constants}$$

Given that the first two terms, in ascending powers of x , in the series expansion of $f(x)$ are 128 and $36x$,

(b) find the value of a ,

(2)

(c) find the value of b .

(2)

(Total for question = 8 marks)

Q3.

(a) Find the first 4 terms, in ascending powers of x , of the binomial expansion of

$\left(3 - \frac{2x}{9}\right)^8$ giving each term in simplest form.

(4)

$$f(x) = \left(\frac{x-1}{2x}\right)\left(3 - \frac{2x}{9}\right)^8$$

(b) Find the coefficient of x^2 in the series expansion of $f(x)$, giving your answer as a simplified fraction.

(2)

(Total for question = 6 marks)

Q4.

$g(x) = (2 + ax)^8$ where a is a constant

Given that one of the terms in the binomial expansion of $g(x)$ is $3402x^5$

(a) find the value of a .

(4)

Using this value of a ,

(b) find the constant term in the expansion of

$$\left(1 + \frac{1}{x^4}\right)(2 + ax)^8$$

(3)

(Total for question = 7 marks)