The Binomial Expansion Exam Questions Sheet 2

Q1.
Find the first 4 terms, in ascending powers of x, of the binomial expansion of

$$\left(3-\frac{1}{3}x\right)^5$$

giving each term in its simplest form.

(4)

(Total for question = 4 marks)

Q2.
Find the first 3 terms, in ascending powers of x, of the binomial expansion of

$$\left(2-\frac{x}{4}\right)^{10}$$

giving each term in its simplest form.

(4)

(Total for question = 4 marks)

Q3.
Find the first 4 terms, in ascending powers of x, of the binomial expansion of

$$\left(1+\frac{3x}{2}\right)^8$$

giving each term in its simplest form.

(4)

(Total 4 marks)

Q4.
(a) Find the first 3 terms, in ascending powers of x, of the binomial expansion of

$$(2-9x)^4$$

giving each term in its simplest form.

(4)

$$f(x) = (1+kx)(2-9x)^4, \text{ where } k \text{ is a constant}$$

The expansion, in ascending powers of x, of $f(x)$ up to and including the term in x^2 is

$$A - 232x + Bx^2$$

where A and B are constants.

(b) Write down the value of A.

(1)

(c) Find the value of k.

(2)

(d) Hence find the value of B.

(2)

(Total for question = 9 marks)

Q5.

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

$$(3 + bx)^5$$

where b is a non-zero constant. Give each term in its simplest form.

(4)

Given that, in this expansion, the coefficient of x^2 is twice the coefficient of x,

(b) find the value of b.

(2)

(Total 6 marks)

Q6.

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

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

giving each term in its simplest form.

(4)

(b) Use your expansion to estimate the value of $(1.025)^8$, giving your answer to 4 decimal places.

(3)

(Total 7 marks)

Q7.

(a) Find the first four terms, in ascending powers of x, in the binomial expansion of $(1 + kx)^6$, where k is a non-zero constant.

(3)

Given that, in this expansion, the coefficients of x and x^2 are equal, find

(b) the value of k,

(2)

(c) the coefficient of x^3 .

(1)

(Total 6 marks)

Q8.

(a) Find the first 4 terms of the expansion of $\left(1+\frac{x}{2}\right)^{10}$ in ascending powers of x, giving each term in its simplest form.

(4)

(b) Use your expansion to estimate the value of $(1.005)^{10}$, giving your answer to 5 decimal places.

(3)

(Total 7 marks)

Q9.

(a) Find the first 4 terms, in ascending powers of x, of the binomial expansion of $(1 + ax)^7$, where a is a constant. Give each term in its simplest form.

(4)

Given that the coefficient of x^2 in this expansion is 525,

(b) find the possible values of a.

(2)
(Total 6 marks)