Negative & Fractional Powers Difficulty: Easy

Question Paper 2

Level	A Level only
Subject	Maths - Pure
Exam Board	Edexcel
Topic	Binomial Expansion
Sub-Topic	Negative & Fractional Powers
Difficulty	Easy
Booklet	Question Paper 2

Time allowed: **44 minutes**

Score: **/37**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>76%	61%	52%	42%	33%	23%	<23%

$$f(x) = (2 + kx)^{-3}, \quad |kx| < 2, \text{ where } k \text{ is a positive constant}$$

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

$$A + Bx + \frac{243}{16}x^2$$

where A and B are constants.

(a) Write down the value of A.

(1)

(b) Find the value of k.

(3)

(c) Find the value of B.

(2)

(Total 6 marks)

Question 2

Given that in the expansion of $\frac{1}{(1+ax)^2}$ the coefficient of the x^2 term is 75, find

(a) the possible values of a,

(4 marks)

(b) the corresponding coefficients of the x^3 term.

(2 marks)

(Total 6 marks)

Question 3

The first three terms in the binomial expansion of $(a+bx)^{\frac{1}{3}}$ are $4-\frac{1}{8}x+cx^2+\ldots$.

(a) Find the values of a and b.

(5 marks)

(b) State the range of values of x for which the expansion is valid.

(2 marks)

(c) Find the value of c.

(2 marks)

(Total 9 marks)

Question 4

Use the binomial theorem to expand $(4 - 3x)^{\frac{1}{2}}$, in ascending powers of x, up to and including the term in x^3. Give each coefficient as a simplified fraction.

(5)

(Total 5 marks)

Question 5

$$f(x) = \frac{1}{\sqrt{(9+4x^2)}}, \qquad |x| < \frac{3}{2}$$

Find the first three non-zero terms of the binomial expansion of $f(x)$ in ascending powers of x. Give each coefficient as a simplified fraction.

(6)

(Total 6 marks)

Question 6

Given that the binomial expansion of $(1 + kx)^{-4}$, $|kx| < 1$, is

$$1 - 6x + Ax^2 + \ldots$$

(a) find the value of the constant k,

(2)

(b) find the value of the constant A, giving your answer in its simplest form.

(3)

(Total 5 marks)