

Algebra

Difficulty: Hard

Question Paper 2

Level	A Level
Subject	Maths Pure 3
Exam Board	CIE
Topic	Algebra
Difficulty	Hard
Booklet	Question Paper 2

Time allowed: 69 minutes

Score: /49

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E
>90%	81%	70%	58%	46%	34%

Question 1

$$\text{Let } f(x) = \frac{7x^2 - 15x + 8}{(1 - 2x)(2 - x)^2}.$$

(i) Express $f(x)$ in partial fractions.

[5]

(ii) Hence obtain the expansion of $f(x)$ in ascending powers of x , up to and including the term in x^2 .

[5]

Question 2

$$\text{Let } f(x) = \frac{6 + 7x}{(2 - x)(1 + x^2)}.$$

[4]

(i) Express $f(x)$ in partial fractions.

(ii) Show that, when x is sufficiently small for x^4 and higher powers to be neglected, [5]

$$f(x) = 3 + 5x - \frac{1}{2}x^2 - \frac{15}{4}x^3.$$

Question 3

(i) Express $\frac{3x^2 + x}{(x + 2)(x^2 + 1)}$ in partial fractions. [5]

(ii) Hence obtain the expansion of $\frac{3x^2 + x}{(x + 2)(x^2 + 1)}$ in ascending powers of x , up to and including the term in x^3 . [5]

Question 4

(i) Express $\frac{2-x+8x^2}{(1-x)(1+2x)(2+x)}$ in partial fractions. [5]

(ii) Hence obtain the expansion of $\frac{2-x+8x^2}{(1-x)(1+2x)(2+x)}$ in ascending powers of x , up to and including the term in x^2 . [5]

Question 5

(i) Express $\frac{5x + 3}{(x + 1)^2(3x + 2)}$ in partial fractions. [5]

(ii) Hence obtain the expansion of $\frac{5x + 3}{(x + 1)^2(3x + 2)}$ in ascending powers of x , up to and including the term in x^2 , simplifying the coefficients. [5]