

Algebraic Long Division

Difficulty: Medium

Question Paper 2

Level	A Level
Subject	Maths Pure 3
Exam Board	CIE
Topic	Algebra
Sub-Topic	Algebraic long division
Difficulty	Medium
Booklet	Question Paper 2

Time allowed: 29 minutes

Score: /21

Percentage: /100

Grade Boundaries:

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

Question 1

The polynomial $x^4 + 2x^3 + ax + b$, where a and b are constants, is divisible by $x^2 - x + 1$. Find the values of a and b . [5]

Question 2

The polynomial $x^4 + 3x^2 + a$, where a is a constant, is denoted by $p(x)$. It is given that $x^2 + x + 2$ is a factor of $p(x)$. Find the value of a and the other quadratic factor of $p(x)$. [4]

Question 3

The polynomial $4x^3 - 4x^2 + 3x + a$, where a is a constant, is denoted by $p(x)$. It is given that $p(x)$ is divisible by $2x^2 - 3x + 3$.

(i) Find the value of a . [3]

(ii) When a has this value, solve the inequality $p(x) < 0$, justifying your answer. [3]

Question 4

The polynomial $x^4 + 3x^3 + ax + 3$ is denoted by $p(x)$. It is given that $p(x)$ is divisible by $x^2 - x + 1$.

(i) Find the value of a . [4]

(ii) When a has this value, find the real roots of the equation $p(x) = 0$. [2]