Modulus Function

Question Paper 2

Level	International A Level
Subject	Maths
Exam Board	CIE
Topic	Algebra
Sub Topic	Modulus Function
Booklet	Question Paper 2

Time Allowed: **54 minutes**

Score: **/45**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1 Solve the inequality $|2x + 1| < |2x - 5|$. [3]

2 Solve the inequality $|x - 2| \geqslant |x + 5|$. [3]

3 The polynomial $2x^3 - 4x^2 + ax + b$, where a and b are constants, is denoted by $p(x)$. It is given that when $p(x)$ is divided by $(x + 1)$ the remainder is 4, and that when $p(x)$ is divided by $(x - 3)$ the remainder is 12.

(i) Find the values of a and b. [5]

(ii) When a and b have these values, find the quotient and remainder when $p(x)$ is divided by $(x^2 - 2)$. [3]

4 Solve the equation $|x^3 - 14| = 13$, showing all your working. [4]

5 Solve the inequality $|4 - 5x| < 3$. [3]

6 Solve the inequality $|x + 2| > |\frac{1}{2}x - 2|$. [4]

7 The polynomial $ax^3 - 3x^2 - 11x + b$, where a and b are constants, is denoted by $p(x)$. It is given that $(x + 2)$ is a factor of $p(x)$, and that when $p(x)$ is divided by $(x + 1)$ the remainder is 12.

(i) Find the values of a and b. [5]

(ii) When a and b have these values, factorise $p(x)$ completely. [3]

8 Solve the inequality $|2x - 3| \leqslant |3x|$. [4]

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9 **(i)** The polynomial $x^4 + ax^3 - x^2 + bx + 2$, where a and b are constants, is denoted by $\mathrm{p}(x)$. It is given that $(x - 1)$ and $(x + 2)$ are factors of $\mathrm{p}(x)$. Find the values of a and b. [5]

(ii) When a and b have these values, find the quotient when $\mathrm{p}(x)$ is divided by $x^2 + x - 2$. [3]