

Remainder and Factor Theorems

Chapter 8: Remainder and Factor Theorems · Topic 1

Key Concept

The Remainder Theorem states that when a polynomial $p(x)$ is divided by $(x-a)$, the remainder equals $p(a)$.

The Factor Theorem states that $(x-a)$ is a factor of $p(x)$ if and only if $p(a) = 0$.

These theorems help us find factors of polynomials without performing long division, making factorisation more efficient.

Understanding these theorems is essential for factorising higher-degree polynomials and solving related algebraic equations.

Quick Revision Notes

- Remainder Theorem: dividing $p(x)$ by $(x-a)$, remainder = $p(a)$.
- Factor Theorem: $(x-a)$ is a factor if $p(a)=0$.
- These avoid long division for finding factors.
- They make factorisation more efficient.
- Used for higher-degree polynomials.
- They help solve related algebraic equations.
- Both theorems are related concepts.
- Practice builds polynomial factorisation skills.

Practice Questions

- 1 Find the remainder when x^3+2x+1 is divided by $(x-1)$.
- 2 Check if $(x-2)$ is a factor of x^2-4 .
- 3 Use the Factor Theorem to find a factor of a given polynomial.
- 4 Discuss the relationship between these two theorems.
- 5 Solve a factorisation problem using these theorems.
- 6 Explain the Remainder Theorem in your own words.