

Relationship Between Zeroes and Coefficients

Chapter 2: Polynomials · Topic 2

Key Concept

For example, to find a quadratic polynomial whose zeroes sum to 5 and whose product is 6, we can construct it as $x^2 - (\text{sum})x + (\text{product}) = x^2 - 5x + 6$. This relationship is derived directly from expanding the factored form of a quadratic, $(x - \text{zero1})(x - \text{zero2})$, and comparing coefficients — a technique that connects the factored, zero-based view of a polynomial to its standard coefficient-based form.

Quick Revision Notes

- For ax^2+bx+c : sum of zeroes = $-b/a$, product of zeroes = c/a .
- A quadratic can be constructed from its zeroes' sum and product: $x^2 - (\text{sum})x + (\text{product})$.
- This relationship comes from expanding the factored form $(x - \text{zero1})(x - \text{zero2})$.
- It connects the factored (zero-based) view to the standard coefficient-based form of a quadratic.

Practice Questions

- 1 Find a quadratic polynomial whose zeroes sum to 5 and whose product is 6.
- 2 For the polynomial $2x^2-7x+3$, find the sum and product of its zeroes.
- 3 Construct a quadratic polynomial with zeroes summing to -3 and product 2.