

# Zeroes of a Polynomial and Factorisation

Chapter 2: Polynomials · Topic 2

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## Key Concept

This relationship, known as the Factor Theorem, allows polynomials to be factorised systematically: if we can find a zero of a polynomial, we automatically know one of its factors, and can use polynomial division to find the remaining factor(s). For a quadratic polynomial, there can be up to two zeroes (or none among real numbers, in some cases), corresponding to the points where its graph, a parabola, crosses the x-axis.

## Quick Revision Notes

- A zero of a polynomial is a value making the polynomial equal to zero.
- For  $p(x)=x-2$ , the zero is  $x=2$ , since  $p(2)=0$ .
- Factor Theorem: if 'a' is a zero of  $p(x)$ , then  $(x-a)$  is a factor of  $p(x)$ .
- A quadratic polynomial can have up to two zeroes, corresponding to x-axis crossings on its graph.

## Practice Questions

- 1 Find the zero of the polynomial  $2x-6$ .
- 2 Using the Factor Theorem, find a factor of a polynomial with zero  $x=4$ .
- 3 Explain how the zeroes of a quadratic polynomial relate to its graph.