UNIVERSIDAD SERGIO ARBOLEDA

Mathematics

Introduction to Calculus

Polynomials and Complex Numbers

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Contents

Chapter 1

Polynomials and Complex Numbers

1.1 Real zeroes of polynomials

Theorem

Rational Zeros Theorem. If the polynomial $P(x) = a_n X^n + a_{n-1} X^{n-1} + \cdots + a_1 X + a_0$ has integer coefficients, then every rational zero of p is of the form $\frac{p}{q}$ where p is a factor of the constant coefficient a_0 and q is a factor of the leading coefficient a_n.

Theorem

Remainder Theorem. If the polynomial $P(x)$ is divided by $x - c$, then the reminder is the value $P(c)$.

Theorem

Factor Theorem. c is a zero of P if and only if $x - c$ is a factor of $P(x)$.