Precalculus

2-06 Zeros of Polynomial Functions

Fundamental Theorem of Algebra

If $f(x)$ is polynomial of degree n, then there is at least 1 zero
- **There are exactly n zeros**
- **There are n linear factors (Linear Factorization Theorem)**

Find all zeros of $f(x) = x^4 - 16$

Find all the zeros of $f(x) = 2x^4 - 9x^3 - 18x^2 + 71x - 30$

Descartes's Rule of Signs

Let $f(x) = a_n x^n + a_{n-1} x^{n-1} + \cdots + a_2 x^2 + a_1 x + a_0$ be a polynomial with real coefficients and $a_0 \neq 0$

The number of _____real zeros is equal to the number of variations in sign of _____ or less by even integer

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Describe the possible real zeros of $f(x) = -2x^3 + 5x^2 - x + 8$

Complex Conjugate Theorem

If a complex number $a + bi$ is a zero, then _____ is also a zero.

Find a polynomial with real coefficients with zeros $\frac{2}{3}$, -1, $3 + \sqrt{2}i$