

Section 2.5 The Fundamental Theorem of Algebra

Objective: In this lesson you learned how to determine the number of zeros of polynomial functions and find them.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Fundamental Theorem of Algebra

Linear Factorization Theorem

I. The Fundamental Theorem of Algebra (Pages 182–183)

In the complex number system, every n th-degree polynomial function has _____ zeros.

Example 1: How many zeros does the polynomial function $f(x) = 5 - 2x^2 + x^3 - 12x^5$ have?

An n th-degree polynomial can be factored into _____ linear factors.

Example 2: List all of the zeros of the polynomial function $f(x) = x^3 - 2x^2 + 36x - 72$.

What you should learn

How to determine the number of zeros of polynomial functions and how to find all zeros of polynomial functions, including complex zeros

II. Conjugate Pairs (Page 184)

Let $f(x)$ be a polynomial function that has real coefficients. If $a + bi$, where $b \neq 0$, is a zero of the function, then we know that _____ is also a zero of the function.

What you should learn

How to find conjugate pairs of complex zeros

III. Factoring a Polynomial (Pages 184–186)

To write a polynomial of degree $n > 0$ with real coefficients as a product without complex factors, write the polynomial as . . .

What you should learn
How to find zeros of polynomials by factoring

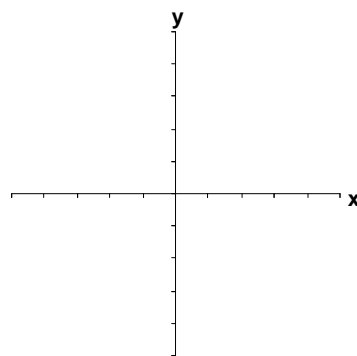
A quadratic factor with no real zeros is said to be

_____.

Example 3: Write the polynomial $f(x) = x^4 + 5x^2 - 36$

- (a) as the product of linear factors and quadratic factors that are irreducible over the reals, and
- (b) in completely factored form.

Explain why a graph cannot be used to locate complex zeros.

Additional notes**Homework Assignment**

Page(s)

Exercises