

Section 3.2 Polynomial Functions of Higher Degree

Objective: In this lesson you learned how to sketch and analyze graphs of polynomial functions.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Continuous

Extrema

Relative minimum

Relative maximum

Repeated zero

Multiplicity

Intermediate Value Theorem

I. Graphs of Polynomial Functions (Pages 237–238)

Name two basic features of the graphs of polynomial functions.

- 1)
- 2)

Will the graph of $g(x) = x^7$ look more like the graph of $f(x) = x^2$ or the graph of $f(x) = x^3$? Explain.

What you should learn

How to use transformations to sketch graphs of polynomial functions

II. The Leading Coefficient Test (Pages 239–240)

State the **Leading Coefficient Test**.

What you should learn

How to use the Leading Coefficient Test to determine the end behavior of graphs of polynomial functions

Example 1: Describe the left and right behavior of the graph of

$$f(x) = 1 - 3x^2 - 4x^6.$$

III. Zeros of Polynomial Functions (Pages 240–244)

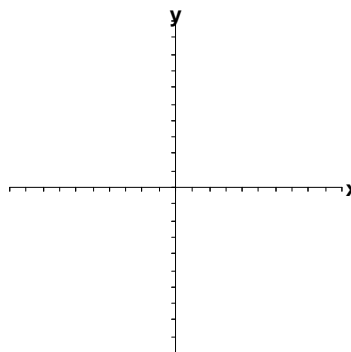
Let f be a polynomial function of degree n . The function f has at most _____ real zeros. The graph of f has at most _____ relative extrema.

What you should learn
How to find and use zeros of polynomial functions to sketch their graphs

Let f be a polynomial function and let a be a real number. List four equivalent statements about the real zeros of f .

- 1)
- 2)
- 3)
- 4)

If a polynomial function f has a repeated zero $x = 3$ with multiplicity 4, the graph of f _____ the x -axis at $x =$ _____. If f has a repeated zero $x = 4$ with multiplicity 3, the graph of f _____ the x -axis at $x =$ _____.



Example 2: Sketch the graph of $f(x) = \frac{1}{4}x^4 - 2x^2 + 3$.

IV. The Intermediate Value Theorem (Pages 244–245)

Interpret the meaning of the Intermediate Value Theorem.

What you should learn
How to use the Intermediate Value Theorem to help locate zeros of polynomial functions

Describe how the Intermediate Value Theorem can help in locating the real zeros of a polynomial function f .

Homework Assignment

Page(s)

Exercises