Section 2.3 Analyzing Graphs of Functions

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

Important Vocabulary

- Define each term or concept.
  - Graph of a function
  - Even function
  - Odd function

I. The Graph of a Function (Pages 201–202)

To find the domain of a function from its graph, . . .

To find the range of a function from its graph, . . .

The Vertical Line Test for functions states . . .

Example 1: Decide whether each graph represents \( y \) as a function of \( x \).

(a) \[ y \]

(b) \[ y \]
II. Zeros of a Function (Page 203)

If the graph of a function of $x$ has an $x$-intercept at $(a, 0)$, then $a$ is a _______ of the function.

The zeros of a function $f$ of $x$ are . . .

To find the zeros of a function, . . .

Example 2: Find the zeros of the function

$$f(x) = 4x^2 + 19x - 5.$$  

III. Increasing and Decreasing Functions (Pages 204–205)

A function $f$ is increasing on an interval if, for any $x_1$ and $x_2$ in the interval, . . .

A function $f$ is decreasing on an interval if, for any $x_1$ and $x_2$ in the interval, . . .

A function $f$ is constant on an interval if, for any $x_1$ and $x_2$ in the interval,. . .

A function value $f(a)$ is called a relative minimum of $f$ if . . .

A function value $f(a)$ is called a relative maximum of $f$ if . . .

The point at which a function changes from increasing to decreasing is a relative _______. The point at which a function changes from decreasing to increasing is a relative _______.

What you should learn

- How to find the zeros of functions
- How to determine intervals on which functions are increasing or decreasing
To approximate the relative minimum or maximum of a function using a graphing utility, . . .

IV. Even and Odd Functions (Page 206)

A function whose graph is symmetric with respect to the $y$-axis is a(n) ________ function. A function whose graph is symmetric with respect to the origin is a(n) ________ function.

Can the graph of a nonzero function be symmetric with respect to the $x$-axis?

Example 3: Decide whether the function $f(x) = 4x^2 - 3x + 1$ is even, odd, or neither.

Additional notes

Homework Assignment

Page(s) Exercises