Course Number

Instructor

Date

Section 2.3 Analyzing Graphs of Functions

Objective: In this lesson you learned how to analyze graphs of functions, including linear, step, and piecewise-defined functions.

Important Vocabulary	Define each term or concept.
Graph of a function	
Greatest integer function	
Step function	
Even function	
Odd function	

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

What you should learn
How to use the Vertical Line Test for functions

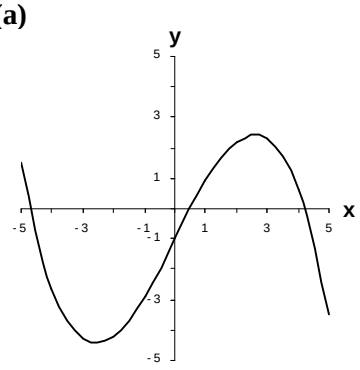
To find the domain of a function from its graph, . . .

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

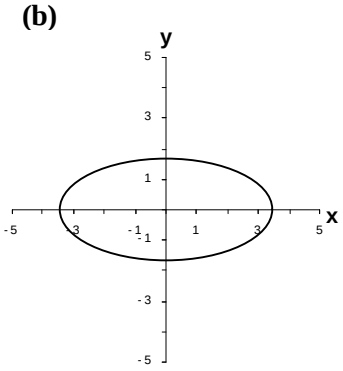
The **Vertical Line Test** for functions states . . .

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

(a)



(b)



II. Zeros of a Function (Page 203)

What you should learn
How to find the zeros of functions

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)

What you should learn
How to determine intervals on which functions are increasing or decreasing

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 _____.

To approximate the relative minimum or maximum of a function using a graphing utility, . . .

IV. Linear Functions (Page 206)

What you should learn
How to identify and graph linear functions

A **linear function** of x is . . .

To sketch the graph of the linear function $f(x) = 3x - 5$, . . .

Example 3: Find the linear function g for which $g(-2) = 4$ and $g(0) = 2$.

V. Step Functions and Piecewise-Defined Functions (Page 207)

What you should learn
How to identify and graph step functions and other piecewise-defined functions

Describe the graph of the greatest integer function.

Example 4: Let $f(x) = \llbracket x \rrbracket$, the greatest integer function. Find $f(3.74)$.

To sketch the graph of a piecewise-defined function, . . .

VI. Even and Odd Functions (Page 208)

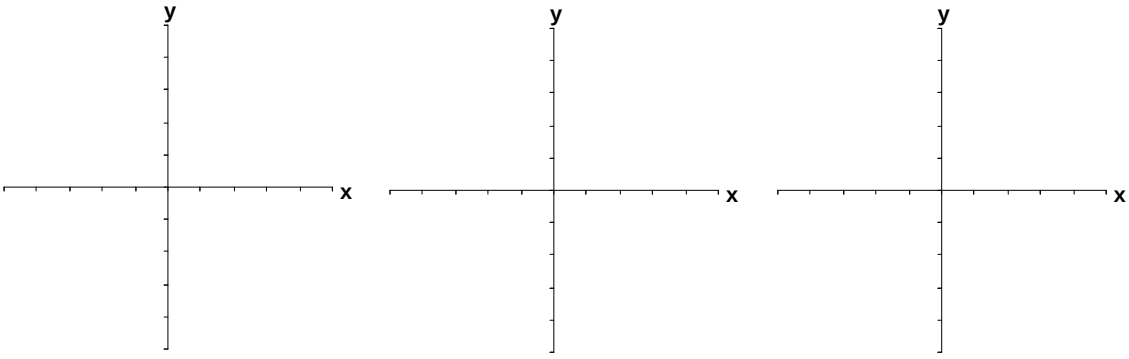
What you should learn
How to identify even and odd functions

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

Additional notes



Homework Assignment

Page(s)

Exercises