Course Number

Instructor

Date

Section 1.3 Graphs of Functions

Objective: In this lesson you learned how to analyze the graphs of 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 30–31)

What you should learn
How to find the domains and ranges of functions and how to use the Vertical Line Test for functions

Explain the use of open or closed dots in the graphs of functions.

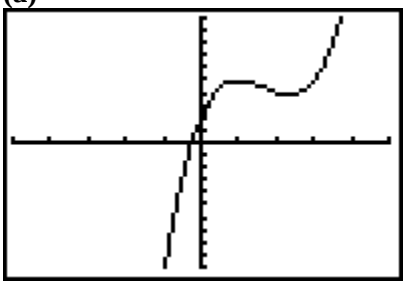
To find the domain of a function from its graph, . . .

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

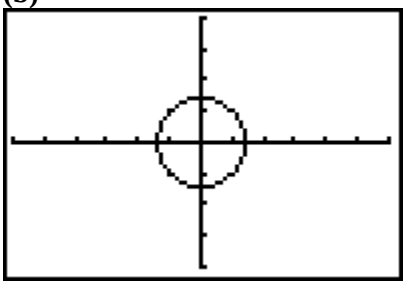
The **Vertical Line Test** for functions states . . .

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

(a)



(b)



II. Increasing and Decreasing Functions (Page 32)

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

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,. . .

Given a graph of a function, to find an interval on which the function is increasing . . .

Given a graph of a function, to find an interval on which the function is decreasing . . .

Given a graph of a function, to find an interval on which the function is constant . . .

III. Relative Minimum and Maximum Values (Pages 33–34)

What you should learn
How to determine relative maximum and relative minimum values of functions

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, . . .

Example 2: Suppose a function C represents the annual number of cases (in millions) of chicken pox reported for the year x in the United States from 1960 through 2000. Interpret the meaning of the function's minimum at (1998, 3).

IV. Graphing Step Functions and Piecewise-Defined Functions (Page 35)

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

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

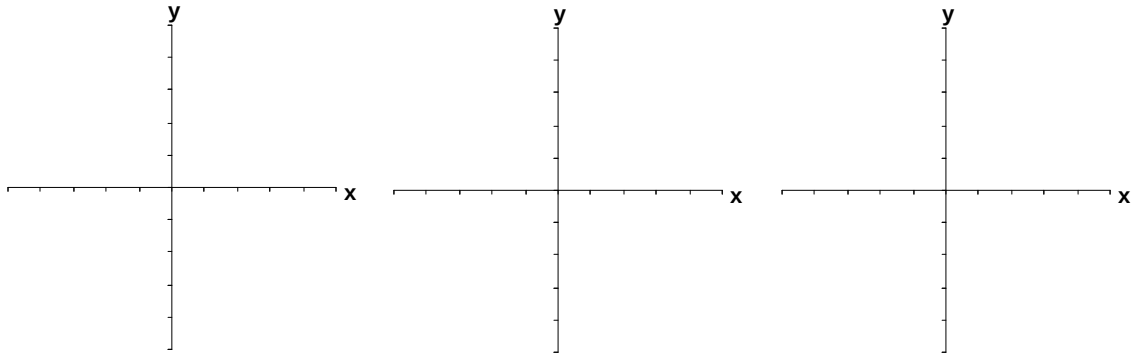
V. Even and Odd Functions (Pages 36–37)

What you should learn
How to identify even and odd functions

A graph is symmetric with respect to the *y*-axis if, whenever (x, y) is on the graph, _____ is also on the graph. A graph is symmetric with respect to the *x*-axis if, whenever (x, y) is on the graph, _____ is also on the graph. A graph is symmetric with respect to the origin if, whenever (x, y) is on the graph, _____ is also on the graph.

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. The graph of a (nonzero) function cannot be symmetric with respect to the _____.

Additional notes



Homework Assignment

Page(s)

Exercises