

**Section 1.3 Graphs of Functions**

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

Course Number

Instructor

Date

**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)

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

***What you should learn***

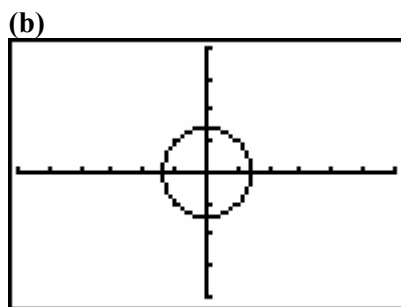
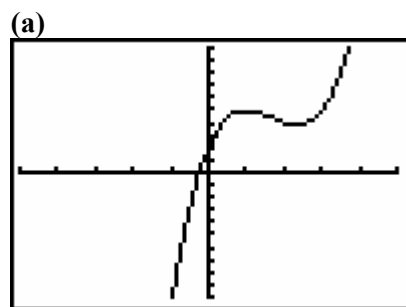
How to find the domains and ranges of functions and how to use the Vertical Line Test for functions

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  $x$ .



## II. Increasing and Decreasing Functions (Page 32)

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 . . .

### *What you should learn*

How to determine intervals on which functions are increasing, decreasing, or constant

## III. Relative Minimum and Maximum Values

(Pages 33–34)

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

### *What you should learn*

How to determine relative maximum and relative minimum values of functions

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)

Describe the graph of the greatest integer function.

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

**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)

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 graph that is symmetric with respect to the  $x$ -axis is . . .

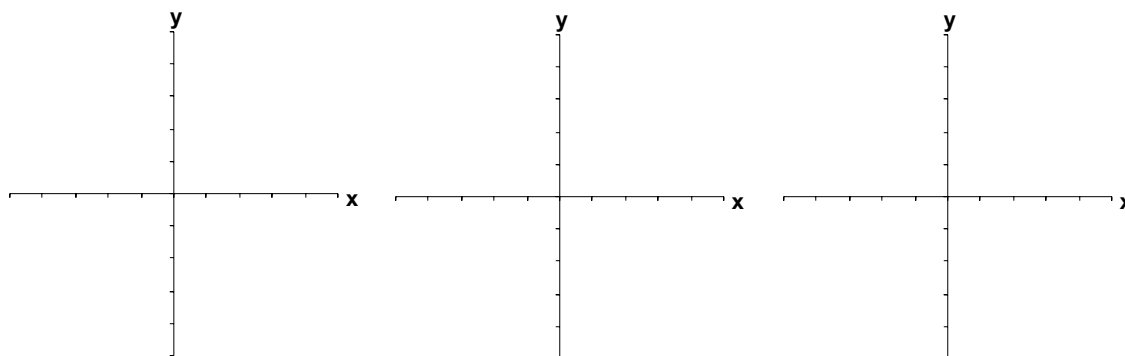
***What you should learn***  
How to identify even and odd functions

A function  $f$  is **even** if, for each  $x$  in the domain of  $f$ ,

$$f(-x) = \underline{\hspace{2cm}}.$$

A function  $f$  is **odd** if, for each  $x$  in the domain of  $f$ ,

$$f(-x) = \underline{\hspace{2cm}}.$$

**Additional notes****Homework Assignment**

Page(s)

Exercises