## Section 1.7 Transformation of Functions

**Objective:** In this lesson you learned how to identify and graph rigid and nonrigid transformations.

I. Shifting Graphs (Pages 67–68)

Let *c* be a positive real number. Complete the following representations of shifts in the graph of y = f(x):

1) Vertical shift *c* units upward:

2) Vertical shift *c* units downward:

3) Horizontal shift *c* units to the right:

4) Horizontal shift *c* units to the left: \_\_\_\_\_

**Example:** Let f(x) = |x|. Write the equation for the function resulting from a vertical shift of 3 units downward and a horizontal shift of 2 units to the right of the graph of f(x).

A family of functions is . . .

## II. Reflecting Graphs (Pages 69–70)

A **reflection** in the *x*-axis is a type of transformation of the graph of y = f(x) represented by h(x) = \_\_\_\_\_\_. A **reflection** in the *y*-axis is a type of transformation of the graph of y = f(x)represented by h(x) = \_\_\_\_\_\_. *What you should learn* How to use reflections to sketch graphs of functions

*What you should learn* How to use vertical and horizontal shifts to sketch graphs of functions

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**Example:** Let f(x) = |x|. Describe the graph of g(x) = |x| in terms of f.

## **III. Nonrigid Transformations** (Page 71)

A rigid transformation is . . .

*What you should learn* How to use nonrigid transformations to sketch graphs of functions

Rigid transformations change only the \_\_\_\_\_\_ of the graph in the *xy*-plane.

Name three types of rigid transformations:

- 1)
- 2)
- 3)

The four types of **nonrigid transformations** are the . . .

For y = f(x) and the real number *c*,

A vertical stretch is represented by \_\_\_\_\_,

where \_\_\_\_\_

A vertical shrink is represented by \_\_\_\_\_,

where \_\_\_\_\_

A horizontal shrink is represented by \_\_\_\_\_,

where \_\_\_\_\_

A horizontal stretch is represented by \_\_\_\_\_,

where \_\_\_\_\_.

**Homework Assignment** 

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Exercises