

Section 1.4 Shifting, Reflecting, and Stretching Graphs

Objective: In this lesson you learned how to identify and graph shifts, reflections, and nonrigid transformations of functions.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Vertical shift

Horizontal shift

Rigid transformations

Nonrigid transformations

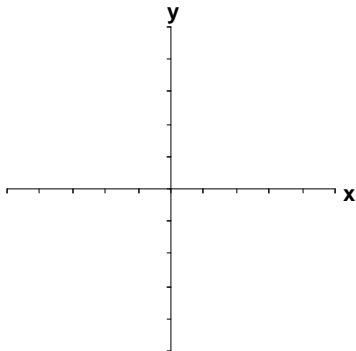
I. Summary of Graphs of Common Functions (Page 42)

Sketch an example of each of the six most commonly used functions in algebra.

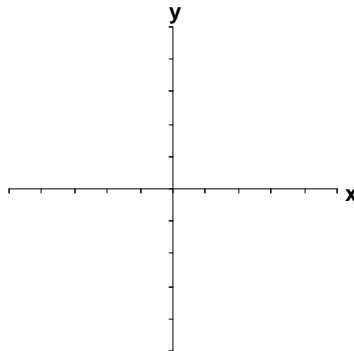
What you should learn

How to recognize graphs of common functions

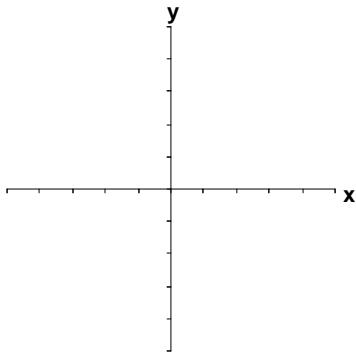
Constant Function



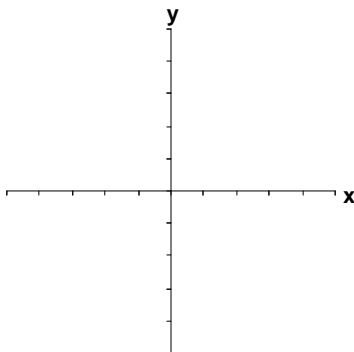
Identity Function



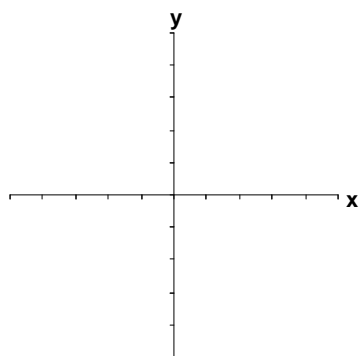
Absolute Value Function



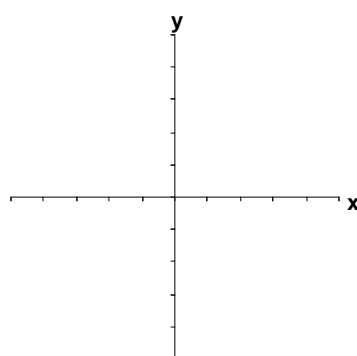
Square Root Function



Quadratic Function



Cubic Function



II. Vertical and Horizontal Shifts (Pages 43–44)

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: _____

What you should learn

How to use vertical and horizontal shifts and reflections to graph functions

Example 1: 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 $f(x)$.

III. Reflecting Graphs (Pages 45–46)

A **reflection** in the x -axis is a type of transformation of the graph of $y = f(x)$ represented by $h(x) = \underline{\hspace{2cm}}$. A **reflection** in the y -axis is a type of transformation of the graph of $y = f(x)$ represented by $h(x) = \underline{\hspace{2cm}}$.

Example 2: Let $f(x) = |x|$. Describe the graph of $g(x) = -|x|$ in terms of f .

IV. Nonrigid Transformations (Page 47)

Name three types of rigid transformations:

- 1)
- 2)
- 3)

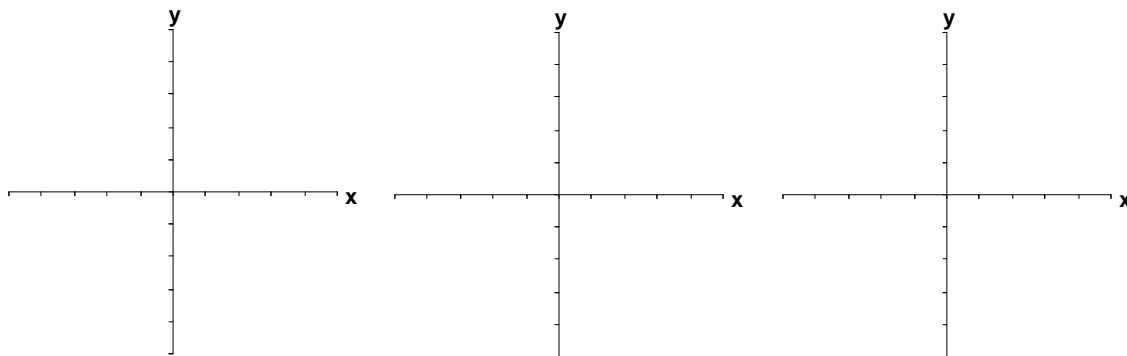
What you should learn
How to use nonrigid transformations to graph functions

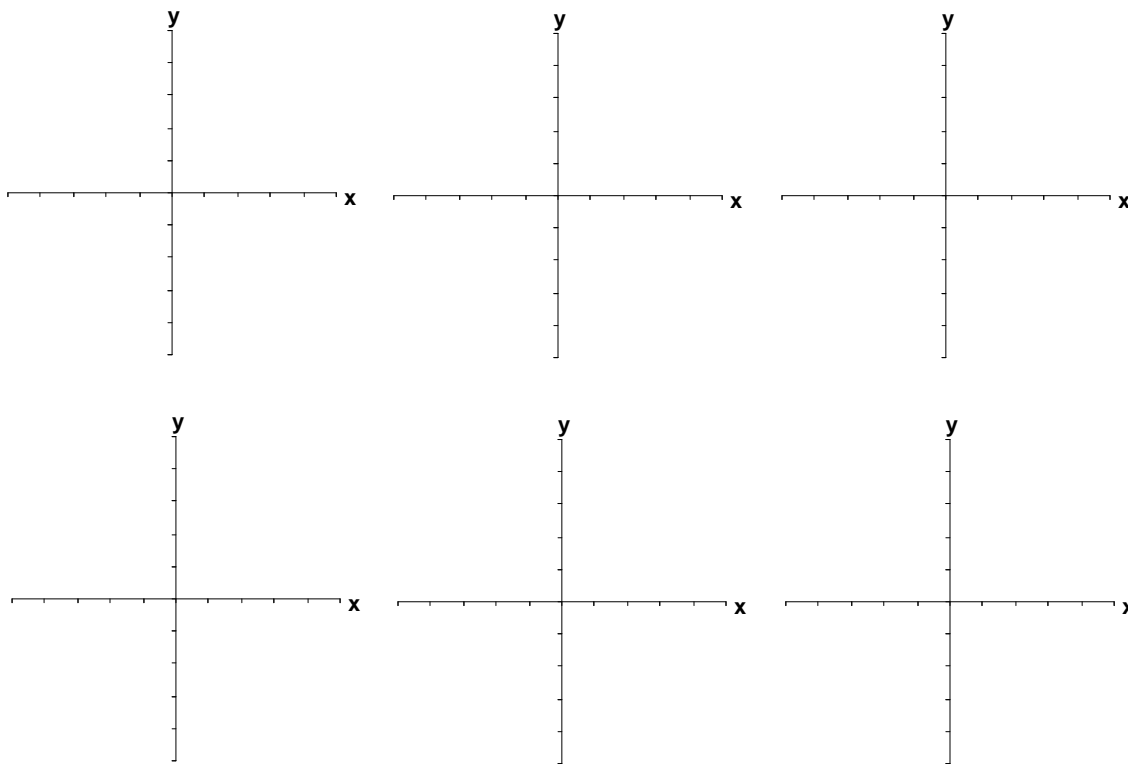
Rigid transformations change only the _____ of the graph in the xy -plane.

Name two types of nonrigid transformations:

- 1)
- 2)

A nonrigid transformation $y = cf(x)$ of the graph of $y = f(x)$ is a _____ if $c > 1$ or a _____ if $0 < c < 1$.

Additional notes

Additional notes**Homework Assignment**

Page(s)

Exercises