

Section 2.4 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

Vertical stretch

Vertical shrink

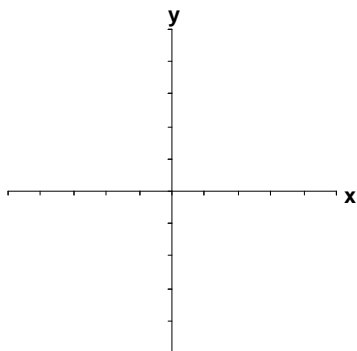
I. Summary of Graphs of Common Functions (Page 214)

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

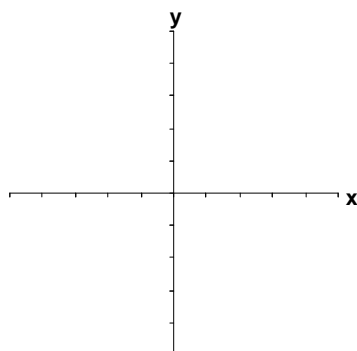
What you should learn

How to recognize graphs of common functions

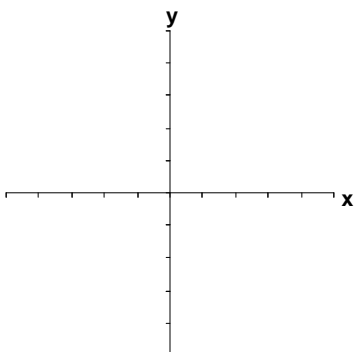
Constant Function



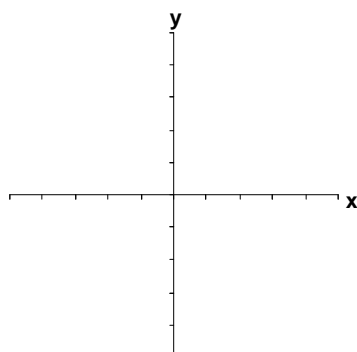
Identity Function



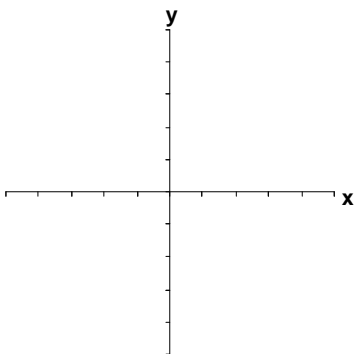
Absolute Value Function



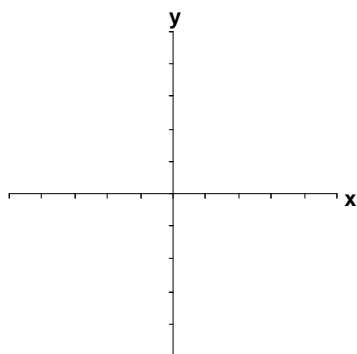
Square Root Function



Quadratic Function



Cubic Function



II. Shifting Graphs (Pages 215–216)

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 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 $f(x)$.

A family of functions is . . .

What you should learn

How to use vertical and horizontal shifts to sketch graphs of functions

III. Reflecting Graphs (Pages 217–218)

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

What you should learn

How to use reflections to sketch graphs of functions

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

IV. Nonrigid Transformations (Page 219)

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:

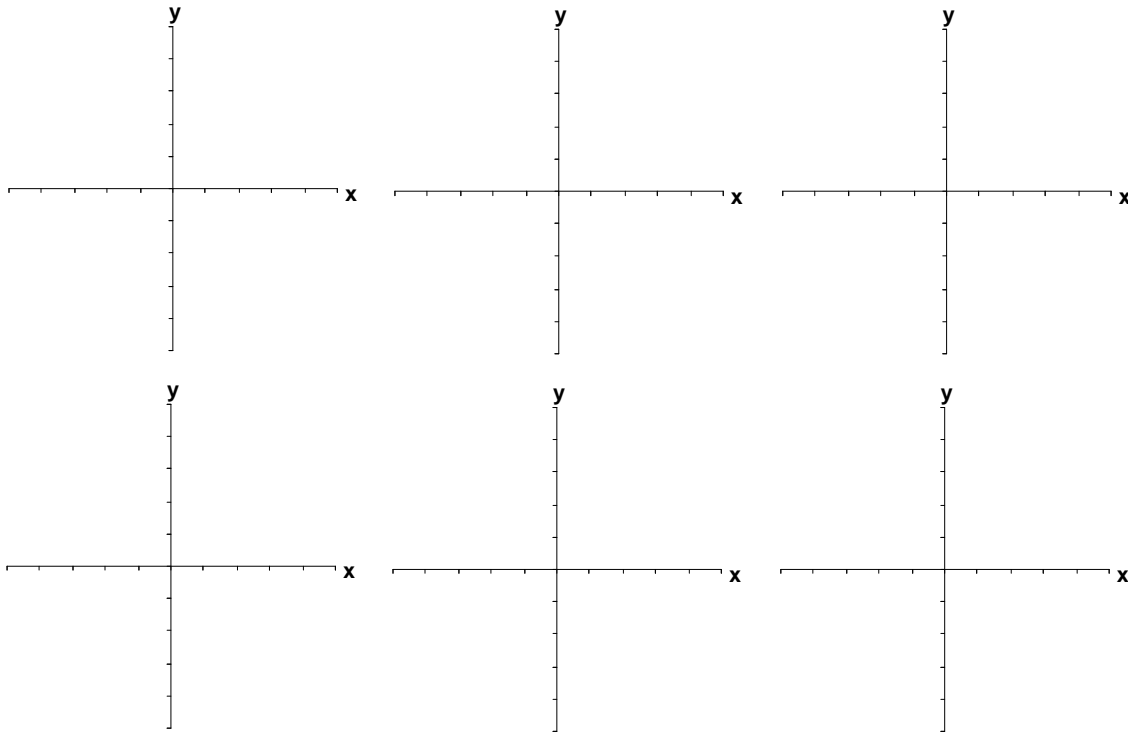
- 1)
- 2)
- 3)

A **nonrigid transformation** is . . .

Name two types of nonrigid transformations:

- 1)
- 2)

Additional notes

Additional notes**Homework Assignment**

Page(s)

Exercises