Course Number

Instructor

Date

Section 1.3 Shifting, Reflecting, and Stretching Graphs

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

Important Vocabulary Define each term or concept.

Vertical shift

Horizontal shift

Rigid transformations

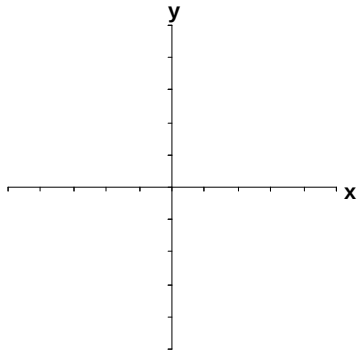
Nonrigid transformations

I. Summary of Graphs of Common Functions (Page 100)

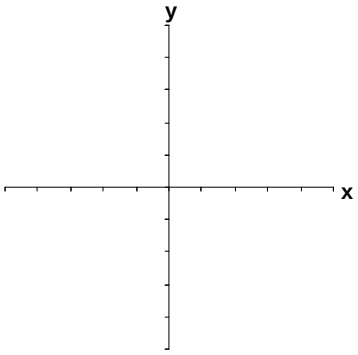
What you should learn
How to recognize graphs of common functions

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

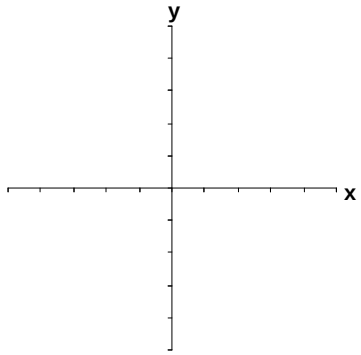
Constant Function



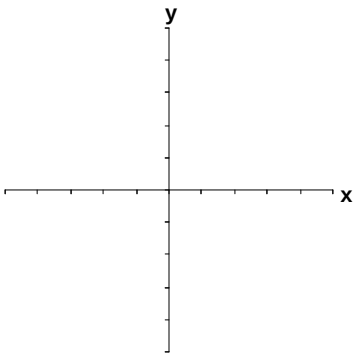
Identity Function



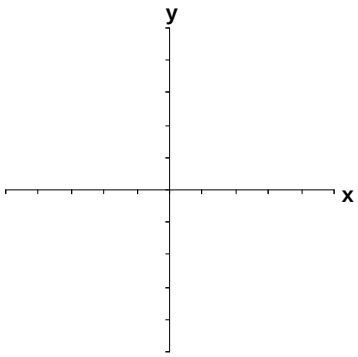
Absolute Value Function



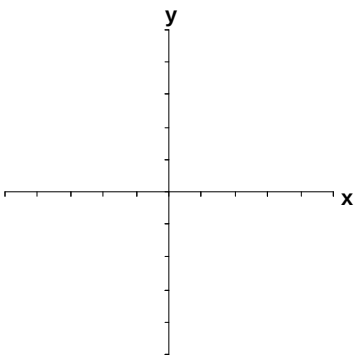
Square Root Function



Quadratic Function



Cubic Function



II. Vertical and Horizontal Shifts (Pages 101–102)

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

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 $f(x)$.

III. Reflecting Graphs (Pages 103–104)

What you should learn
How to use reflections to sketch the graphs of functions

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 $h(x) =$ _____.

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

IV. Nonrigid Transformations (Page 105)

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

Name three types of rigid transformations:

1)

2)

3)

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

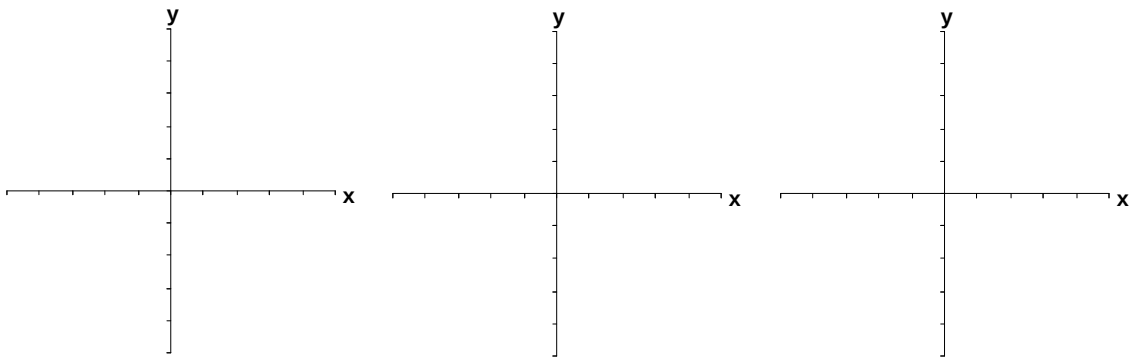
Name two types of nonrigid transformations:

1)

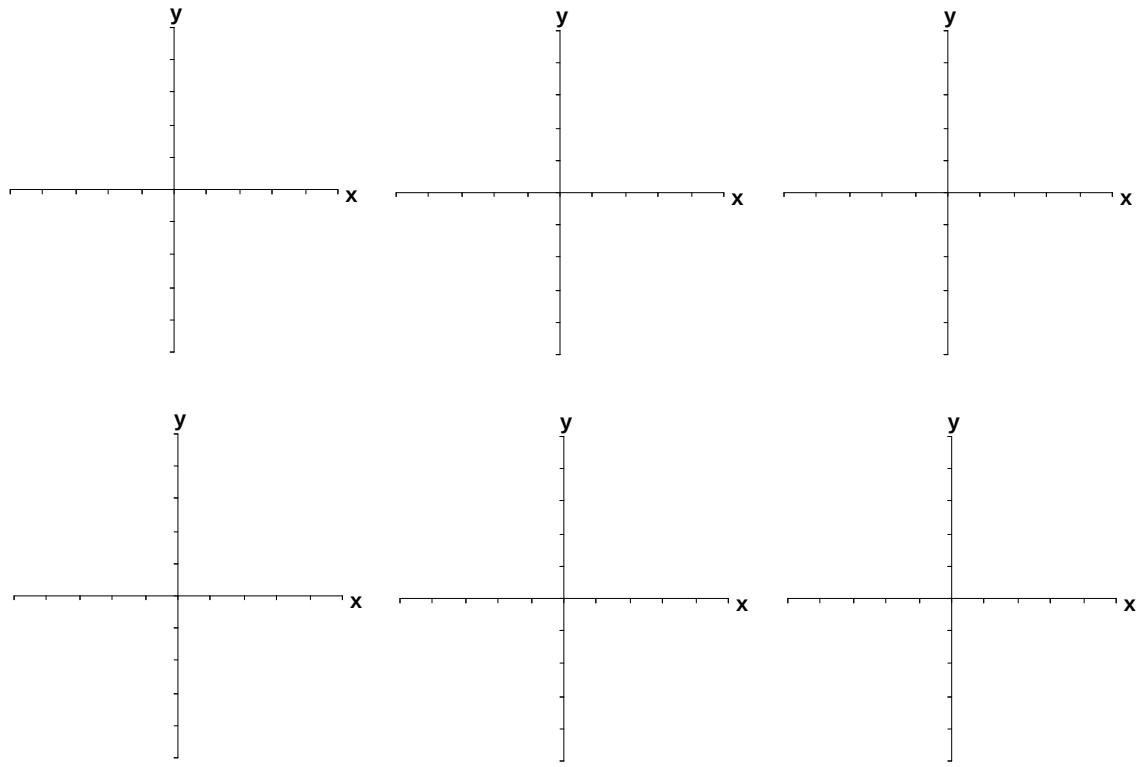
2)

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