## 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.

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 100)

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


Absolute Value Function


Identity Function


Square Root Function


Quadratic Function

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

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: $\qquad$
2) Vertical shift $c$ units downward: $\qquad$
3) Horizontal shift $c$ units to the right: $\qquad$
4) Horizontal shift $c$ units to the left: $\qquad$

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

What you should learn
How to use vertical and horizontal shifts to sketch the graphs of 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 103-104)

A reflection in the $x$-axis is a type of transformation of the graph of $y=f(x)$ represented by $h(x)=$ $\qquad$ . A reflection in
the $y$-axis is a type of transformation of the graph of $y=f(x)$
represented by $h(x)=$ $\qquad$ .

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


Cubic Function

## IV. Nonrigid Transformations (Page 105)

Name three types of rigid transformations:
1)
2)
3)

Rigid transformations change only the $\qquad$ of the graph in the $x y$-plane.

Name two types of nonrigid transformations:
1)
2)

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

## Additional notes



## Additional notes







## Homework Assignment

Page(s)
Exercises

