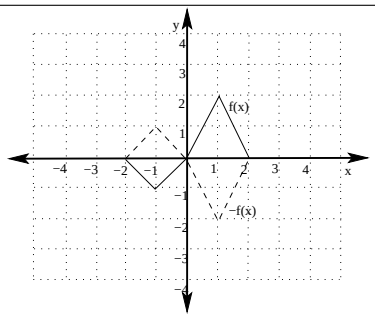
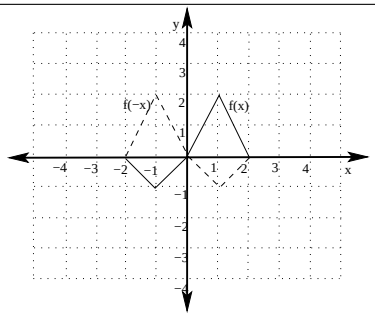
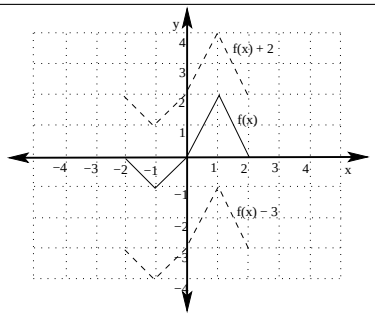
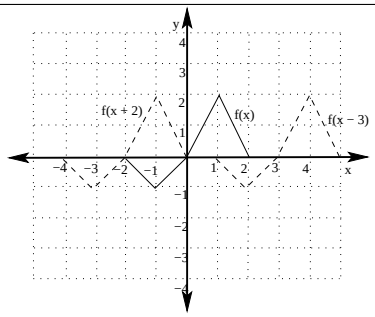
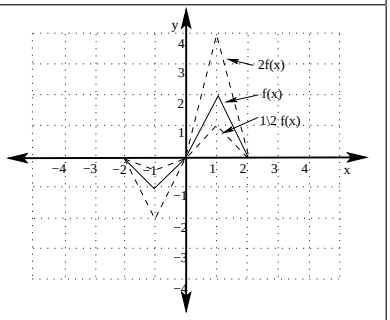
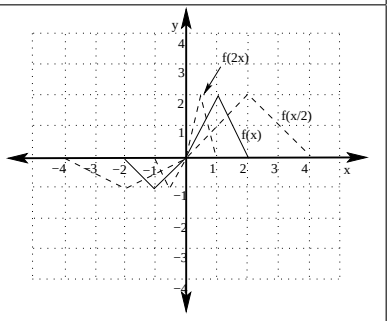
Math 127

Shifts of Functions

The Six Major Types of Shifts

Equation	Effect on the graph	Example:
$y = -f(x)$	Reflection across the x-axis	
$y = f(-x)$	Reflection across the y-axis	
$y = f(x) + c$	Shifted Up if $c > 0$ Shifted Down if $c < 0$	
$y = f(x - c)$	Shifted Right if $c > 0$ Shifted Left if $c < 0$	

Equation	Effect on the graph	Example:
$y = cf(x)$, $c > 0$	Vertical stretch if $c > 1$ Vertical compression if $0 < c < 1$	
$y = f(cx)$, $c > 0$	Horizontal compression if $c > 1$ Horizontal stretch if $0 < c < 1$	

Note: We will often combine more than one shift together to form one new function.

Example: Given $f(x)$, sketch the graph of $2f(x-1)+3$