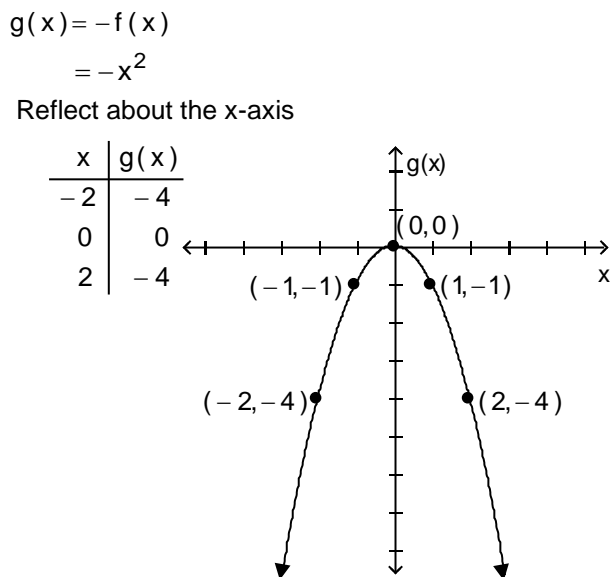
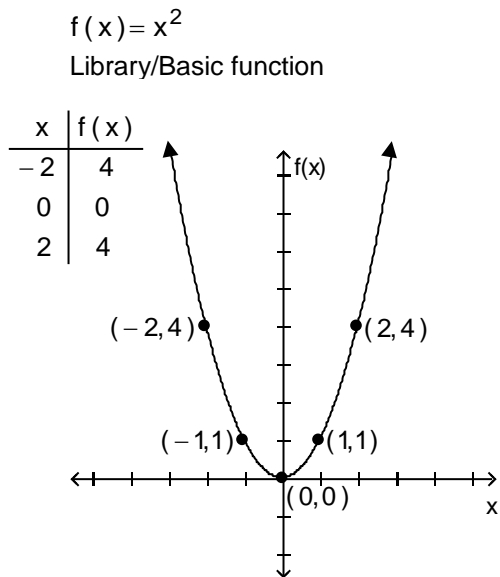


Section 2.5 – Graphing Techniques: Transformations – Day 2

Reflections

When the right side of the function $y = f(x)$ is multiplied by -1 , the graph of the new function $y = -f(x)$ is the reflection about the x-axis of the graph of the function $y = f(x)$.

Example 6: Given $f(x) = x^2$, graph $g(x) = -f(x)$.

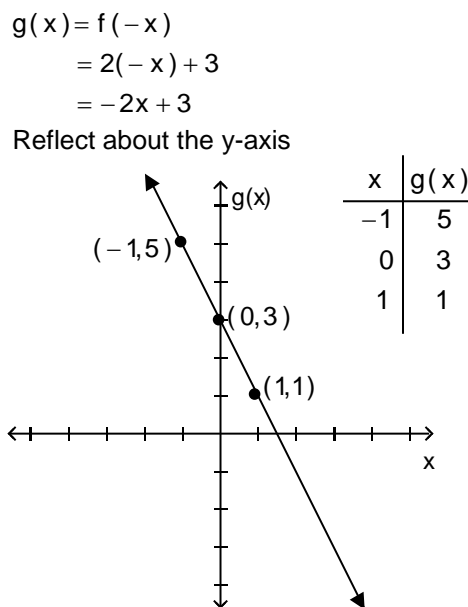
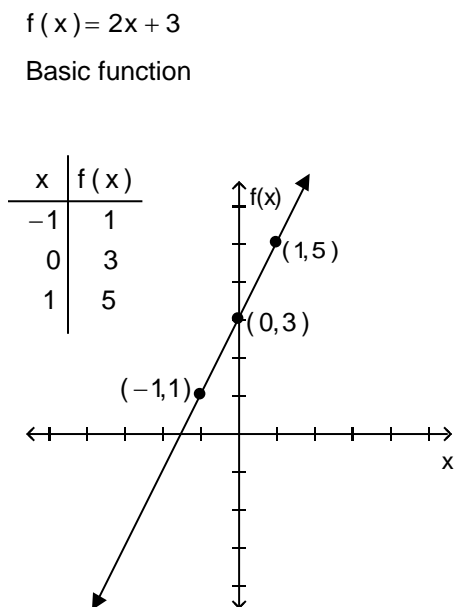


The domain of $g(x)$ is $(-\infty, \infty)$ and the range is $(-\infty, 0]$.

So, for $y = -f(x)$, multiply each y-coordinate on the graph of $y = f(x)$ by -1 .

When the graph of the function $y = f(x)$ is known, the graph of the new function $y = f(-x)$ is the reflection about the y-axis of the graph of the function $y = f(x)$.

Example 7: Given $f(x) = 2x + 3$, graph $g(x) = f(-x)$.



So, for $y = f(-x)$, multiply each x-coordinate on the graph of $y = f(x)$ by -1 .

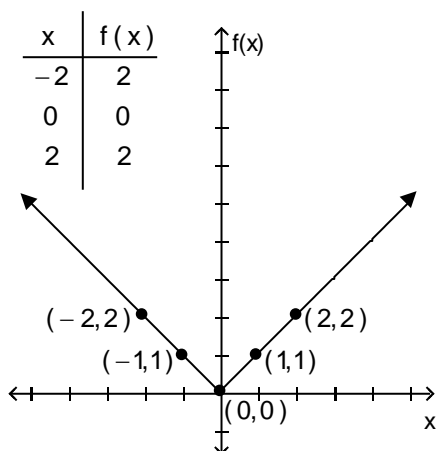
Section 2.5 – Graphing Techniques: Transformations – Day 2 (continued)

Often, a series of transformations is performed on a function rather than just one transformation. It is best to perform the transformation one step at a time.

Example 8: Graph $h(x) = |x - 3| + 2$.

1) $f(x) = |x|$

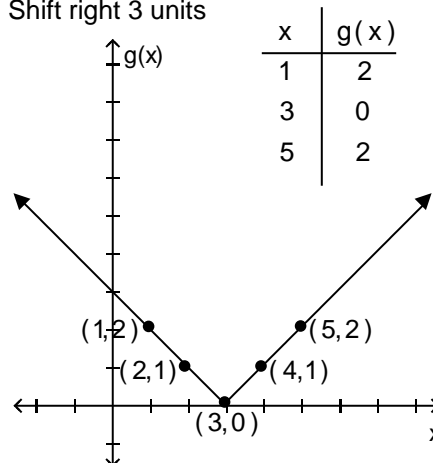
Library/Basic function



2) $g(x) = f(x - 3)$

$= |x - 3|$

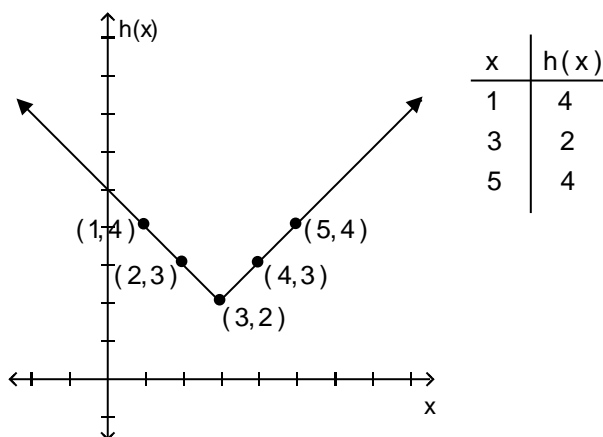
Shift right 3 units



3) $h(x) = g(x) + 2$

$= |x - 3| + 2$

Shift up 2 units



The domain of $h(x)$ is $(-\infty, \infty)$ and the range is $[2, \infty)$.

Although the order in which transformations are performed can be altered, consider using the following order for consistency:

- 1) Reflections
- 2) Compressions and Stretches
- 3) Shifts