

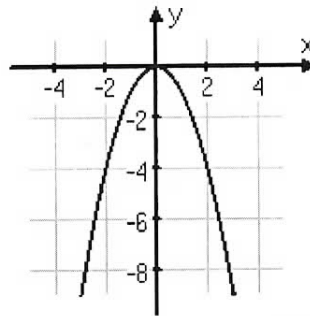
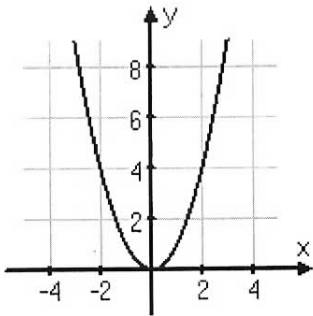
## 13.2 Notes Transformation of Functions: Reflection (flip)

**Reflection over the x-axis:**  $-f(x)$  reflects  $f(x)$  over the  $x$ -axis

A reflection is a mirror image. Placing the edge of a mirror on the  $x$ -axis will form a reflection in the  $x$ -axis. This can also be thought of as "flipping" over the  $x$ -axis.

If the original (parent) function is  $y = f(x)$ , the reflection over the  $x$ -axis is function  $-f(x)$ .

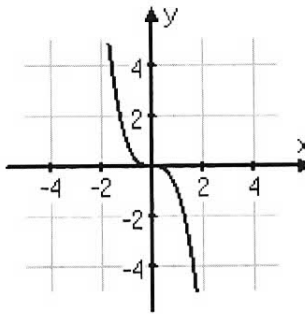
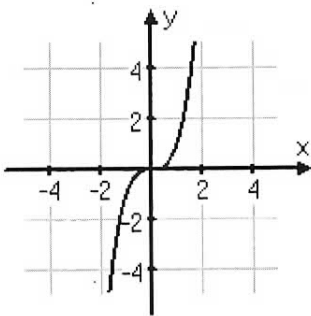
Ex 1: Given the graph on the left,  $f(x) = x^2$ , describe what happens to the graph on the right and write a function  $j(x)$  for it.



flips

$$j(x) = \underline{-x^2}$$

Ex 2: Given the graph on the left,  $f(x) = x^3$ , describe what happens to the graph on the right and write a function  $m(x)$  for it.

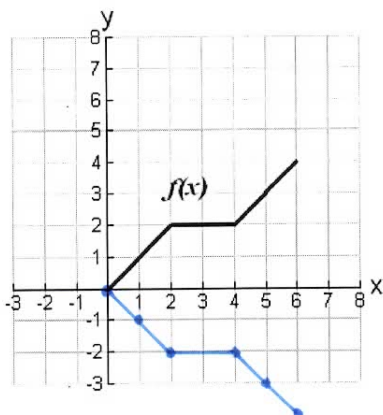


flips

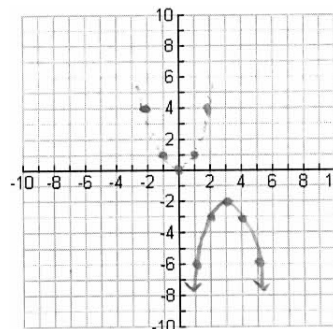
$$m(x) = \underline{-x^3}$$

Ex 3: Given the graph below, graph  $-f(x)$

flip



Ex 4: Given the parent function  $f(x) = x^2$ , graph  $g(x) = -(x-3)^2 - 2$



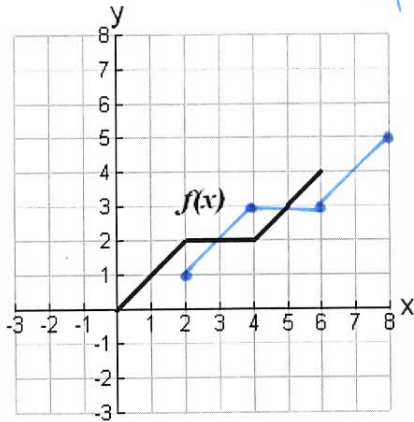
Right 3 →

Down 2 ↓

flip

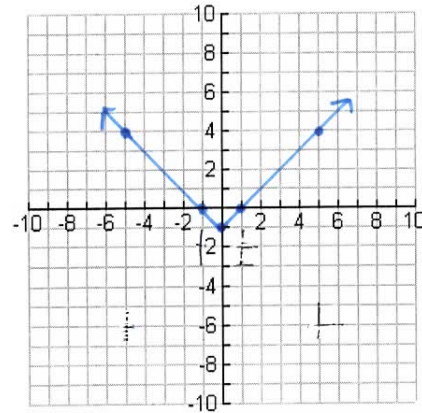
Ex 5: Given the graph of  $f(x)$  below, sketch a graph for  $f(x-2)+1$

Right 2 →  
Up 1 ↑



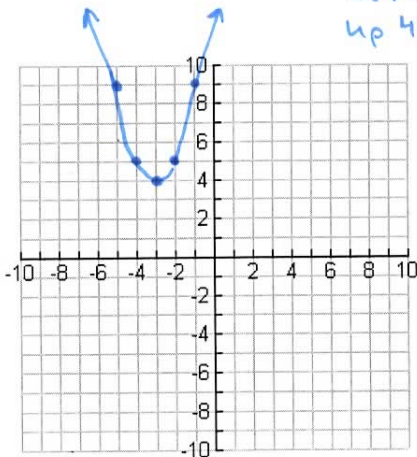
Ex 6: Given the parent function  $f(x) = |x|$ , sketch a graph for  $g(x) = |x| - 1$ .

Down 1 ↓



Ex 7: Given the parent function  $f(x) = x^2$ , sketch a graph for  $r(x) = (x+3)^2 + 4$

Left 3 ←  
Up 4 ↑



Ex 8: Given the parent function  $f(x) = |x|$ , sketch a graph for  $k(x) = |x-1| + 2$

Right 1 →  
Up 2 ↑

