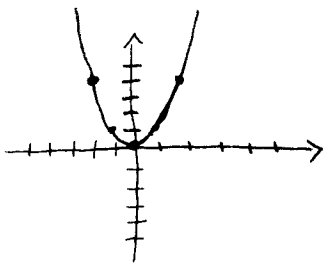
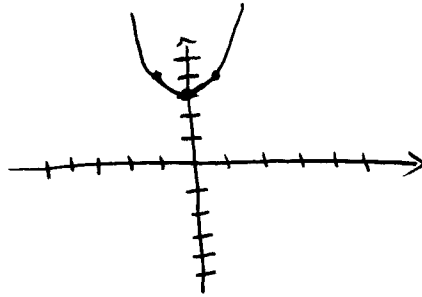


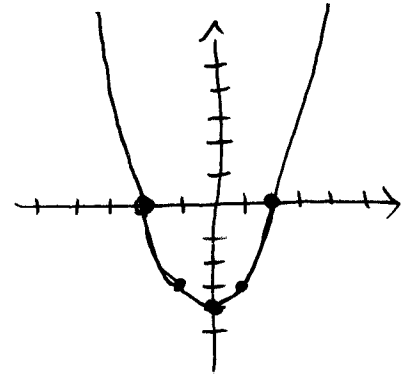
Exercise 1  $f(x) = x^2$



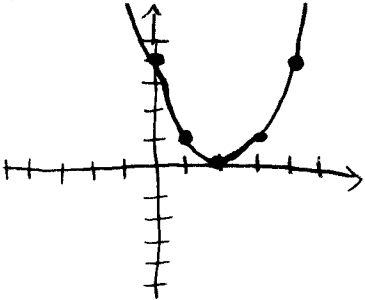
$f(x) = x^2$   
The basic graph.



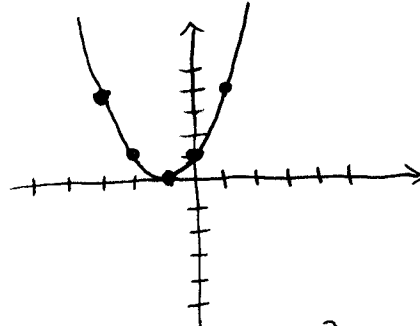
$f(x) + 3 = x^2 + 3$   
f shifted up 3.



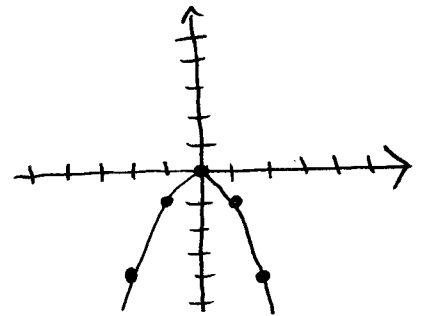
$f(x) - 4 = x^2 - 4$   
f shifted down 4.



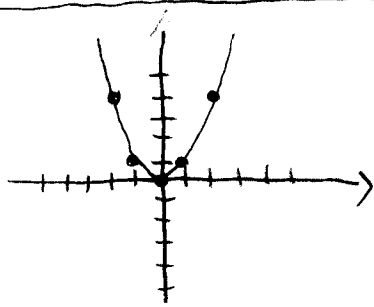
$f(x-2) = (x-2)^2$   
f shifted right 2.



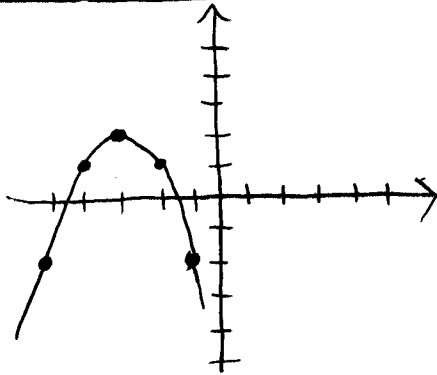
$f(x+1) = (x+1)^2$   
f shifted left 1.



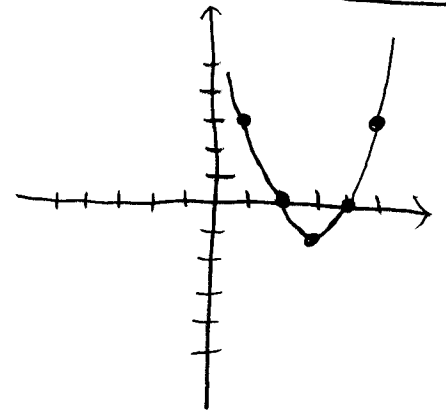
$-f(x) = -x^2$   
f reflected about x-axis.



$f(-x) = (-x)^2$   
f reflected about y-axis.



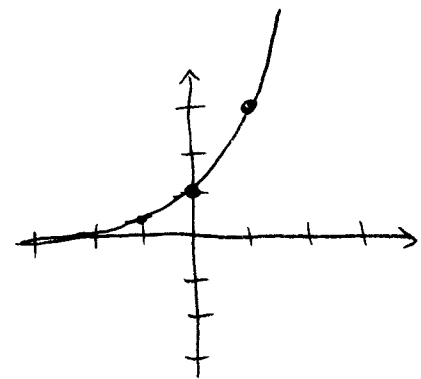
$-f(x+3) + 2 = -(x+3)^2 + 2$   
The graph of  $-f$  shifted  
3 left and 2 up.



$f(-x+3) - 1 = (-x+3)^2 - 1$   
The graph of  $f(-x)$   
shifted 3 right  
and 1 down.

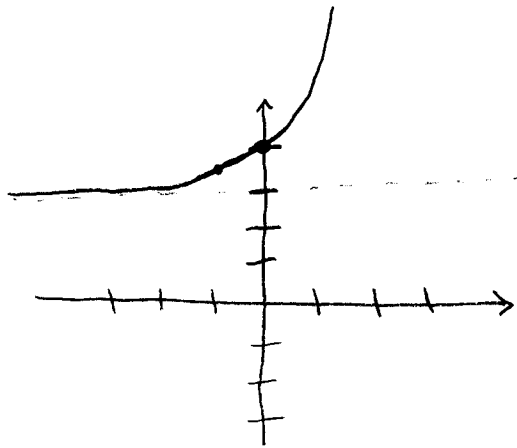
Exercise 2

$$g(x) = 3^x$$



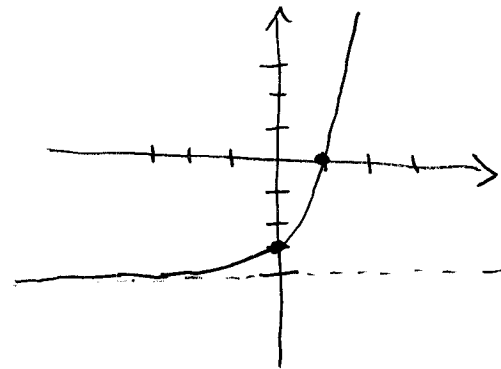
$$g(x) = 3^x$$

The basic graph.



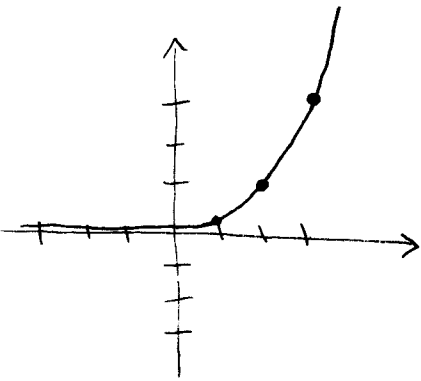
$$g(x) + 3 = 3^x + 3$$

$g$  shifted up by 3.



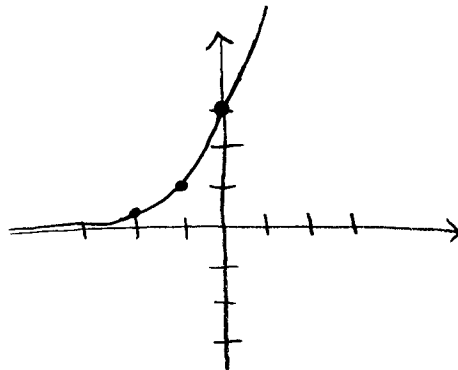
$$g(x) - 4 = 3^x - 4$$

$g$  shifted down by 4.



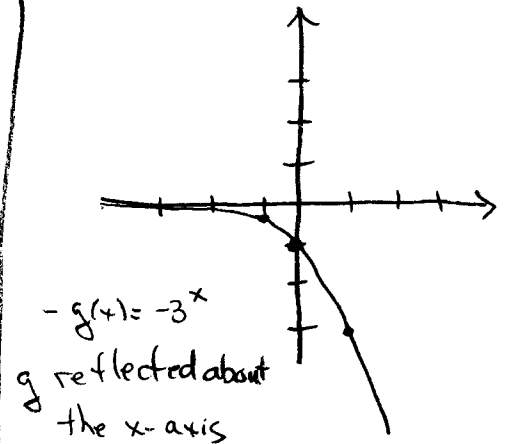
$$g(x-2) = 3^{x-2}$$

$g$  shifted right 2.



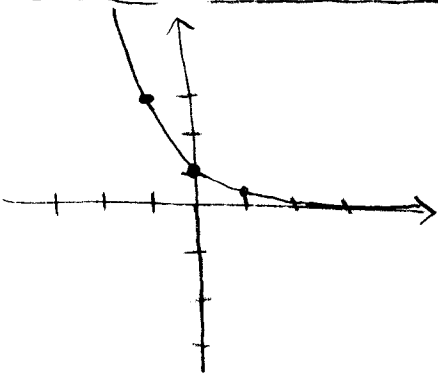
$$g(x+1) = 3^{x+1}$$

$g$  shifted left 1.



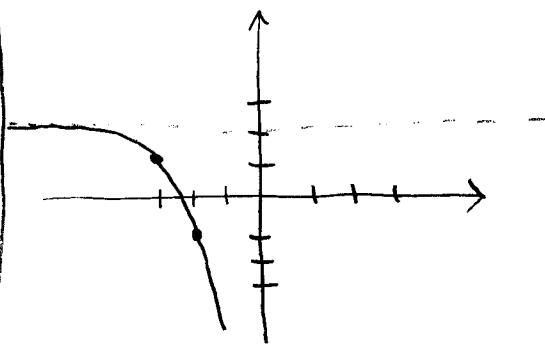
$$-g(x) = -3^x$$

$g$  reflected about the x-axis



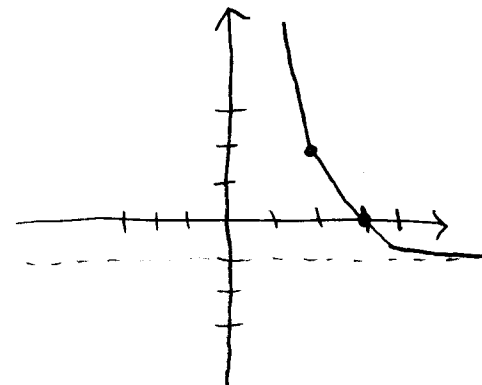
$$g(-x) = 3^{-x}$$

$g$  reflected about the y-axis



$$-g(x+3) + 2 = -3^{x+3} + 2$$

The graph of  $-g$  shifted 3 left and 2 up.



$$g(-x+3) - 1 = 3^{-x+3} - 1$$

The graph of  $g(-x)$  shifted 3 right and 1 down