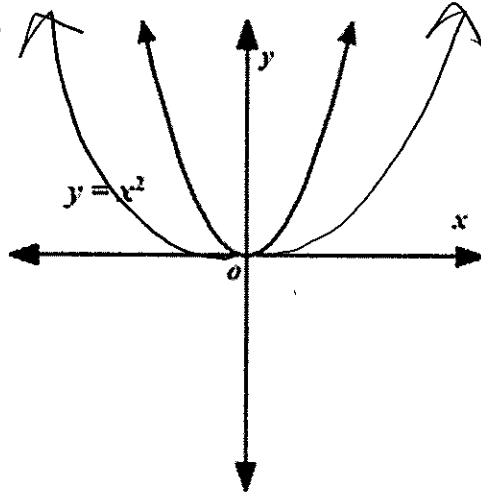


**Do Now:** Describe how the graph of  $g(x)=(x+2)^2+3$  is related to the graph of  $f(x)=x^2$ .

left 2 units & up 3 units

**AIM: TRANSFORMATIONS (DAY 2)**

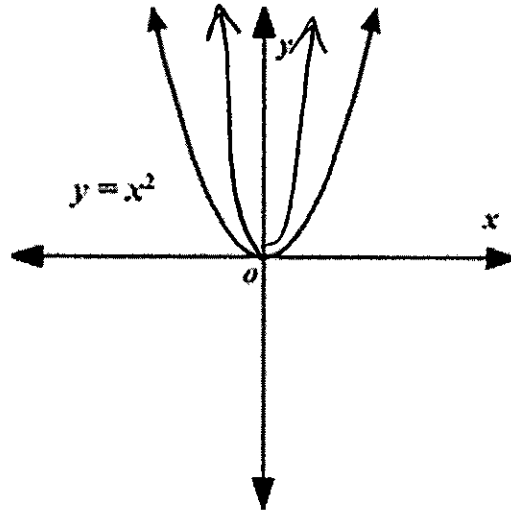
1. Sketch  $h(x)=\frac{1}{2}x^2$ .



(wider)

Describe how the graph of  $h(x)=\frac{1}{2}x^2$  is related to the graph of  $f(x)=x^2$ : horizontal stretch

2. Sketch  $g(x)=3x^2$ .



(narrower)

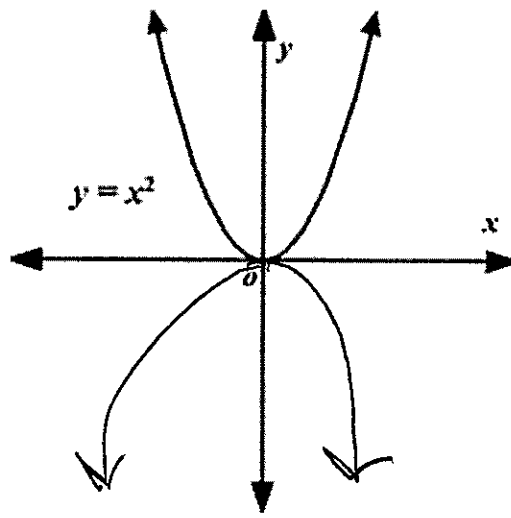
Describe how the graph of  $g(x)=3x^2$  is related to the graph of  $f(x)=x^2$ : vertical stretch

The graph of  $f(x)=ax^2$  is the graph of  $f(x)=x^2$  dilation.

When  $a > 1$  (positive #'s), vertically stretch (narrower)

When  $0 < a < 1$  (positive decimals or fraction #'s), horizontally stretch (wider)

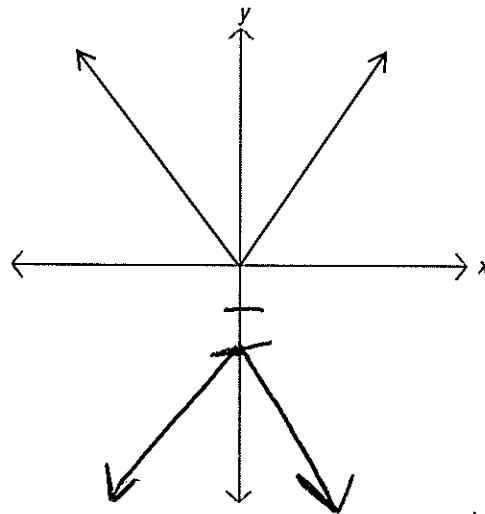
3. Sketch  $j(x) = -x^2$ .



reflection

Describe how the graph of  $j(x) = -x^2$  is related to the graph of  $f(x) = x^2$ : OVER X-AXIS,

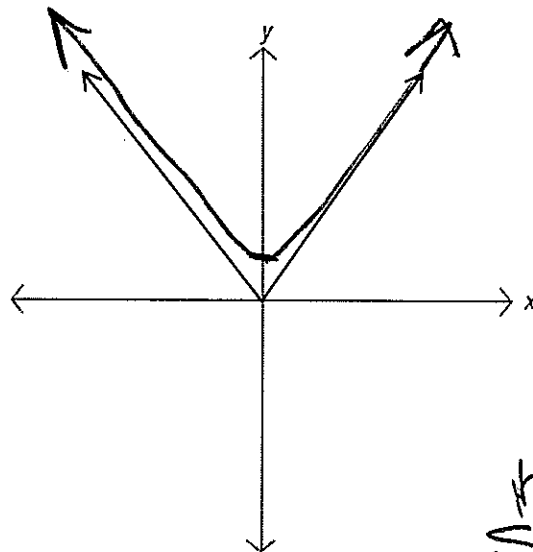
4. Sketch  $g(x) = -|x| - 2$ .



reflection over  
x-axis & down 2  
units

Describe how the graph of  $g(x) = -|x| - 2$  is related to the graph of  $y = |x|$ : units

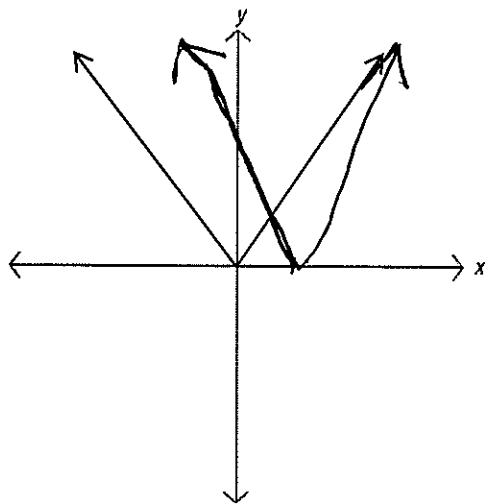
5. Sketch  $h(x) = .5|x| + 1$ .



horizontally  
stretched &  
up one unit

Describe how the graph of  $h(x) = .5|x| + 1$  is related to the graph of  $y = |x|$ : up one unit

6. Sketch  $j(x) = 3|x-1|$ .



vertically stretched = right one unit

Describe how the graph of  $j(x) = 3|x-1|$  is related to the graph of  $y = |x|$ : vertically stretched = right one unit

7. Describe how the graph of each function is related to the parent graph of  $f(x) = x^2$ .

a)  $g(x) = -3x^2 + 1$

- reflection over x-axis
- vertically stretched
- translated up one unit

b)  $g(x) = \frac{1}{5}(x-7)^2$

- horizontally stretched
- translated right 7 units

8. Which is an equation for the function shown in the graph?

(1)  $y = \frac{1}{2}x^2 - 5$

(2)  $y = -2x^2 - 5$

reflection over x-axis

(3)  $y = -\frac{1}{2}x^2 + 5$  ← up 5 units  
↑ wider

(4)  $y = 2x^2 + 5$

