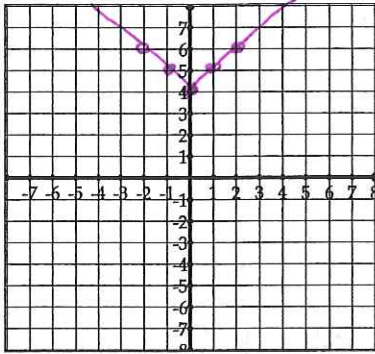


Directions: List the transformations, identify the vertex and graph each of the following:

1.  $f(x) = |x| + 4$

Vertex (0,4)



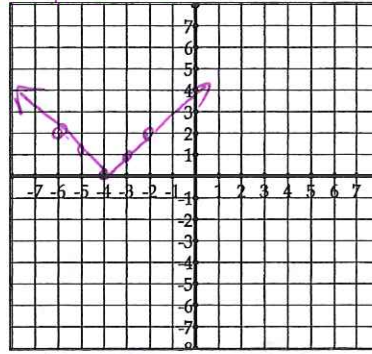
trans: 4 ↑

x	y
-2	2
-1	1
0	0
1	1
2	2

x	y
-2	6
-1	5
0	4
1	5
2	6

2.  $f(x) = |x + 4|$

vertex (-4, 0)



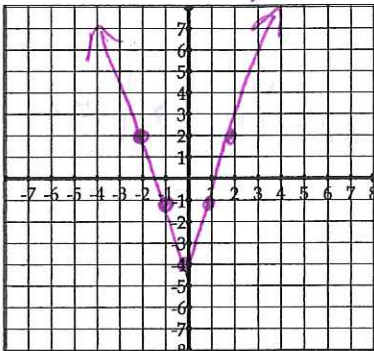
x	y
-2	2
-1	1
0	0
1	1
2	2

x-4	y
-6	2
-5	1
-4	0
-3	1
-2	2

trans:  
4 L

3.  $f(x) = 3|x| - 4$

vertex (0, -4)



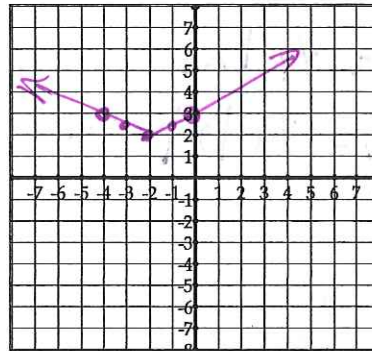
trans: 4 ↓  
vert. stretch by 3

x	y
-2	2
-1	1
0	0
1	1
2	2

x	3y-4
-2	2
-1	-1
0	-4
1	-1
2	2

4.  $f(x) = \frac{1}{2}|x + 2| + 2$

vertex (-2, 2)



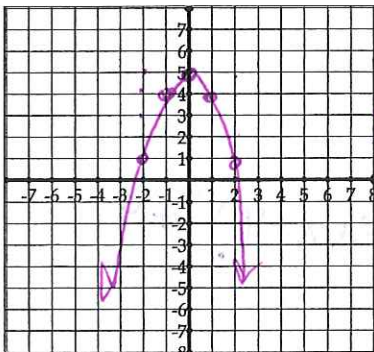
x	y
-2	2
-1	1
0	0
1	1
2	2

x-2	1/2y+2
-4	3
-3	2.5
-2	2
-1	2.5
0	3

Trans:  
2 L & 2 ↑  
vert. comp. 1/2

5.  $f(x) = -x^2 + 5$

vertex (0, 5)



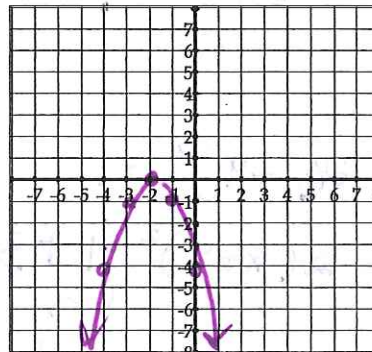
trans: 5 up  
vert. reflection

x	y
-2	4
-1	1
0	0
1	1
2	4

x	-1y+5
-2	1
-1	4
0	5
1	4
2	1

6.  $f(x) = -(x + 2)^2$

vertex (-2, 0)



trans: 2 L &  
vert. refl.

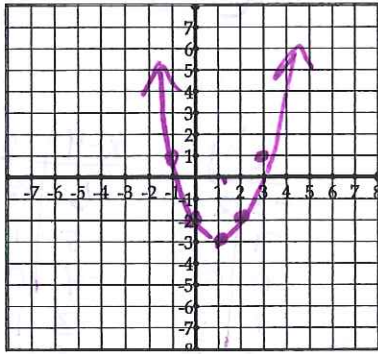
x	y
-2	4
-1	1
0	0
1	1
2	4

x-2	-1y
-4	-4
-3	-1
-2	0
-1	-1
0	-4

vertex (1, -3)

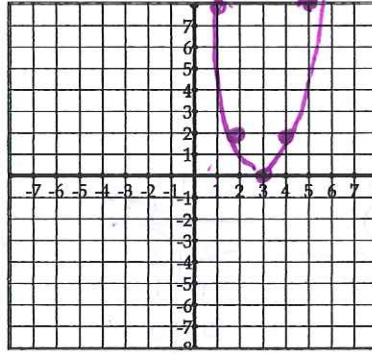
vertex (3, 0)

7.  $f(x) = (x - 1)^2 - 3$



1 R+  
3 ↓

8.  $f(x) = 2(x - 3)^2$



3 R  
vert stretch  
by 2

9. Let  $g(x)$  be a horizontal shift left 5 units, followed by a vertical stretch (scale factor 2) and a reflection across the  $x$ -axis of  $f(x) = x^2$ . Write the rule for  $g(x)$ .

Step 1:  $g(x) = (x)^2$       Step 3:  $g(x) = 2(x+5)^2$       Step 4 ↓  
Step 2:  $g(x) = (x+5)^2$       9.  $g(x) = -2(x+5)^2$

10. Let  $g(x)$  be a vertical compression (scale factor  $\frac{1}{4}$ ) followed by a vertical shift up 2 units of  $f(x) = |x|$ . Write the rule for  $g(x)$ .

Step 1:  $g(x) = \frac{1}{4}|x|$   
Step 2:  $g(x) = \frac{1}{4}|x| + 2$

10.  $g(x) = \frac{1}{4}|x| + 2$

11. Write the equation of the absolute value graph that has been shifted up 5, left 7 and compressed vertically (scale factor  $\frac{1}{3}$ ).

Step 1:  $g(x) = |x| + 5$   
Step 2:  $g(x) = |x+7| + 5$   
Step 3:  $g(x) = \frac{1}{3}|x+7| + 5$

11.  $g(x) = \frac{1}{3}|x+7| + 5$

12. Let  $g(x)$  be a horizontal translation 4 units left and a vertical translation 3 units up of the function  $f(x) = 2x^2 + 1$ . Write the rule for  $g(x)$ .

Step 1:  $g(x) = 2(x+4)^2 + 1$   
Step 2:  $g(x) = 2(x+4)^2 + 1 + 3$   
4

12.  $g(x) = 2(x+4)^2 + 4$