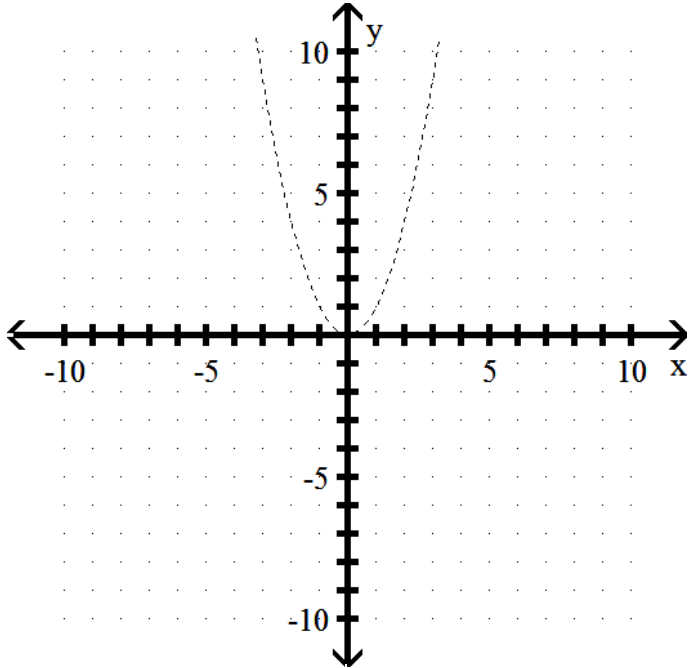


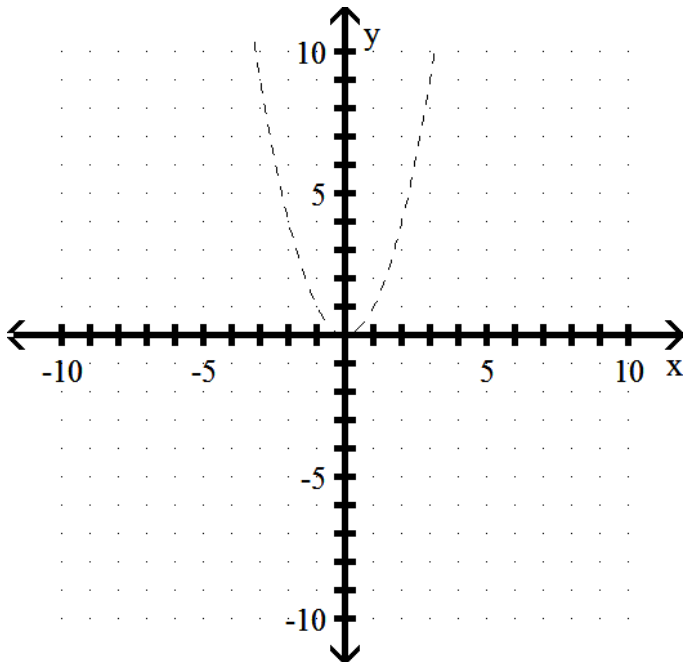
Name \_\_\_\_\_

Graph the function. Compare to the graph of  $y = x^2$  that is already drawn. Note how the graph changes from the graph of  $y = x^2$ .

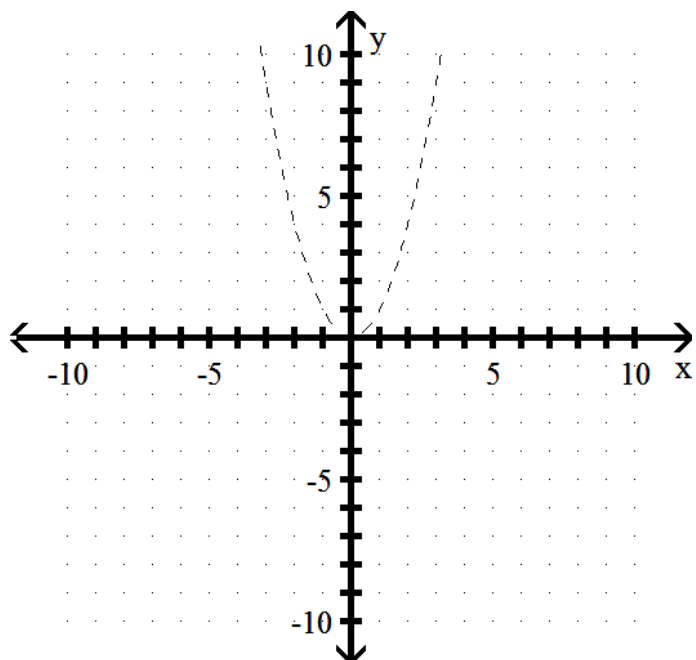
1)  $f(x) = x^2 - 5$



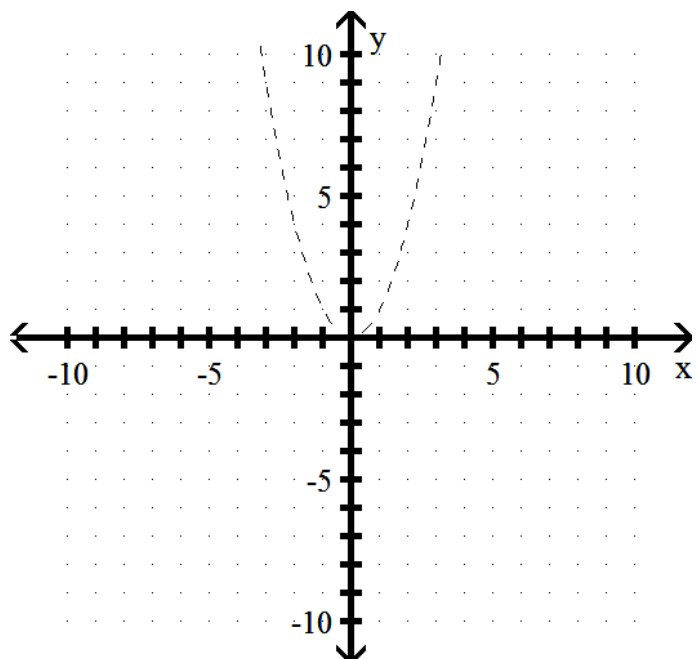
2)  $g(x) = x^2 + 3$



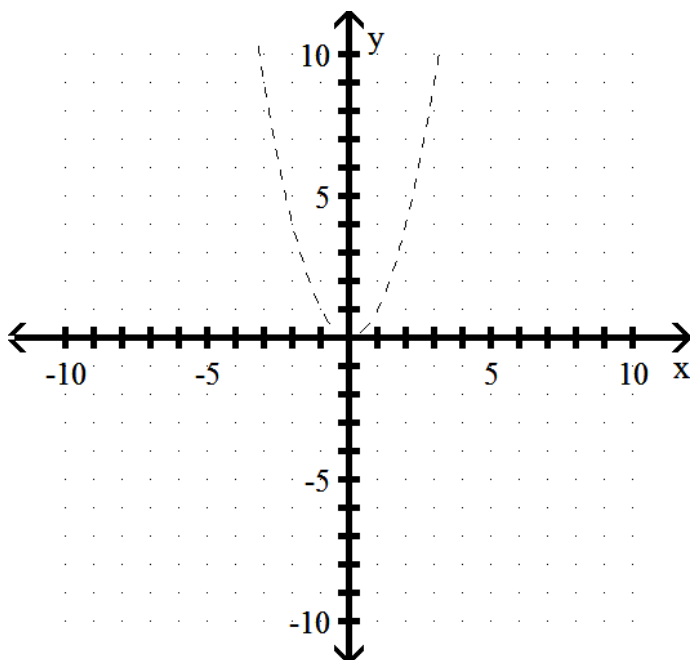
3)  $G(x) = (x + 4)^2$



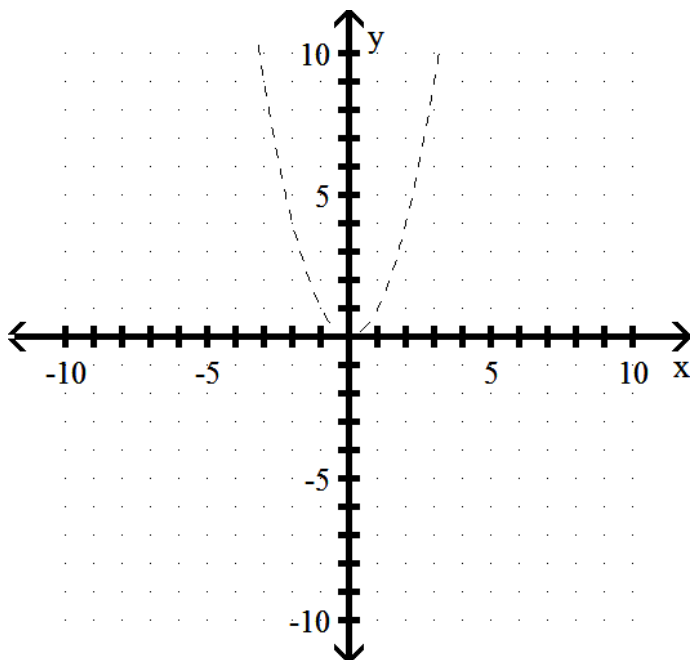
4)  $H(x) = (x - 7)^2$



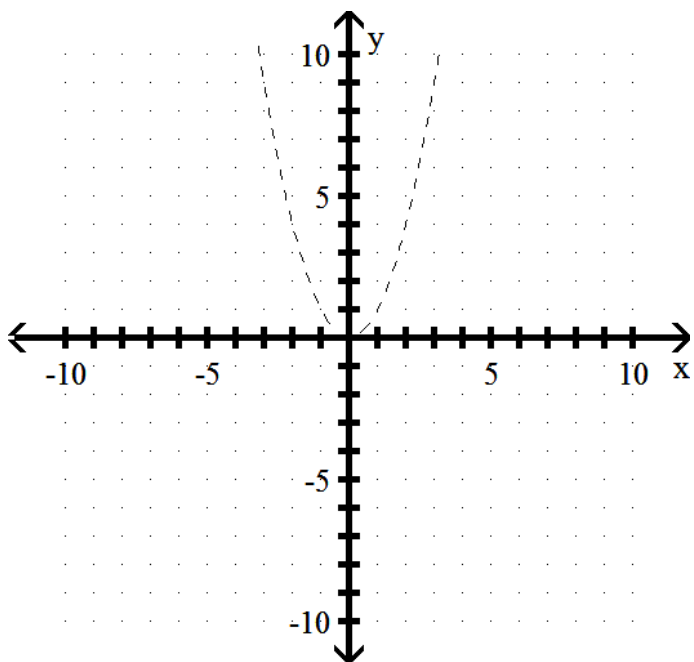
5)  $f(x) = (x + 2)^2 + 2$



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



7)  $h(x) = \frac{1}{3}(x-4)^2 - 3$



Give the vertex and axis of symmetry.

8)  $f(x) = x^2 + 1$

9)  $f(x) = (x + 5)^2 - 4$

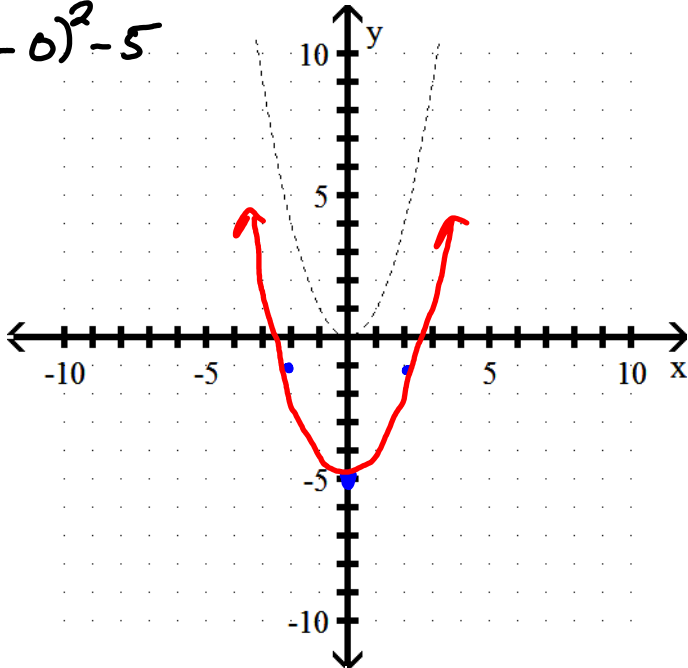
10)  $f(x) = -\frac{1}{4}(x + 5)^2 - 4$

Name \_\_\_\_\_

Graph the function. Compare to the graph of  $y = x^2$  that is already drawn. Note how the graph changes from the graph of  $y = x^2$ .

1)  $f(x) = x^2 - 5$

$$f(x) = (x-0)^2 - 5$$

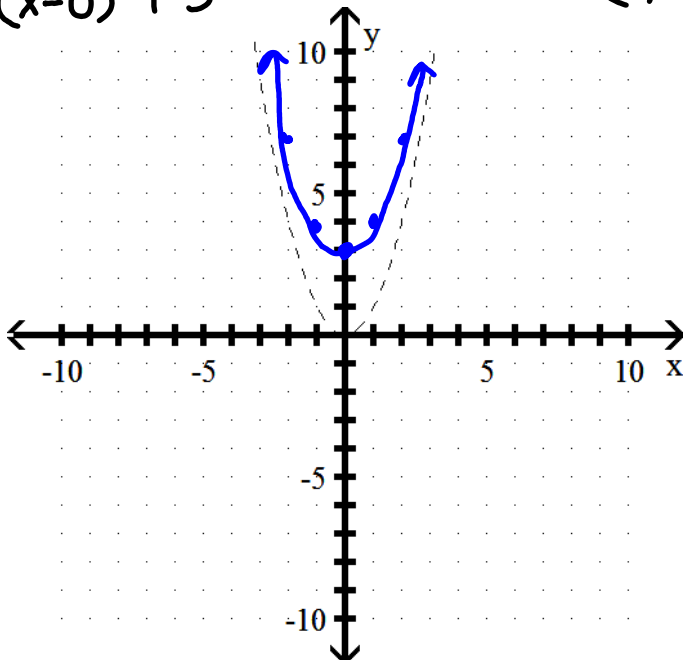
vertex  $(0, -5)$ 

x	y
0	-5
2	-1

shifted 5 units down

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

$$g(x) = (x-0)^2 + 3$$

vertex  $(0, 3)$ 

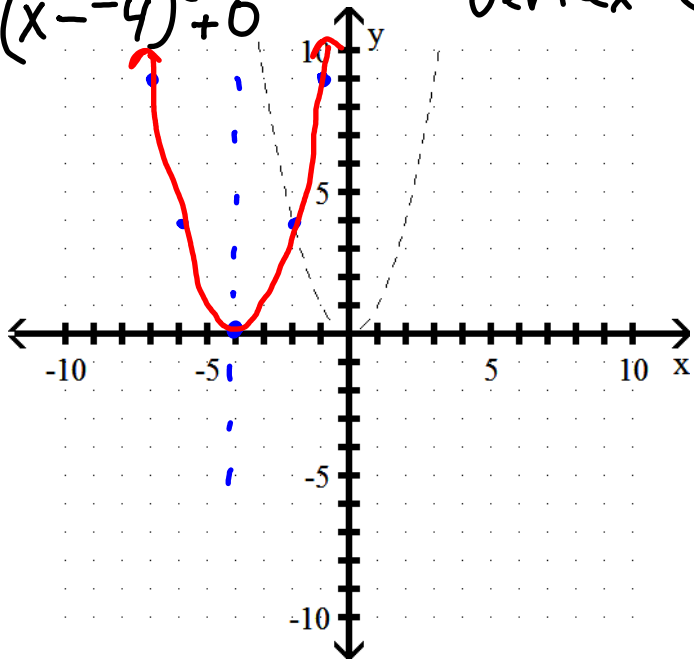
x	y
0	3
1	4
2	7

shifted 3 units up

3)  $G(x) = (x + 4)^2$

$G(x) = (x - (-4))^2 + 0$

vertex  $(-4, 0)$



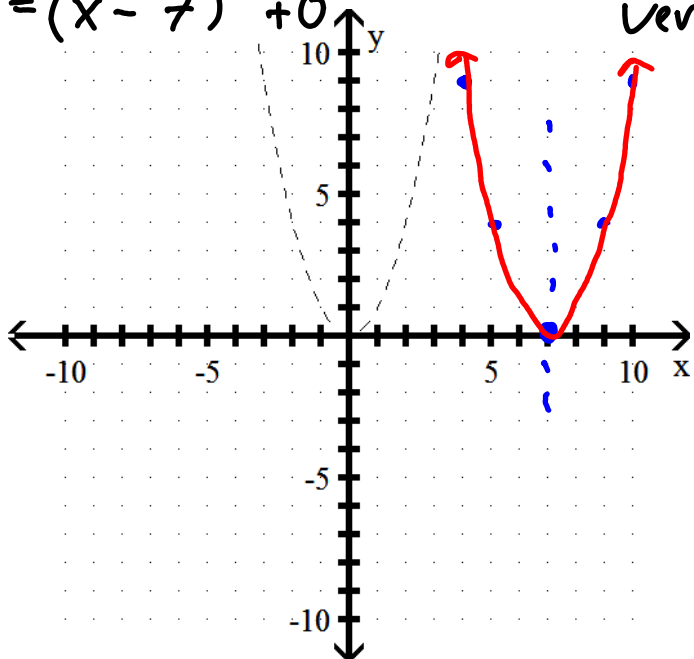
x	y
-4	0
-1	9
-2	4

shifted 4 units  
Left

4)  $H(x) = (x - 7)^2$

$H(x) = (x - 7)^2 + 0$

vertex  $(7, 0)$

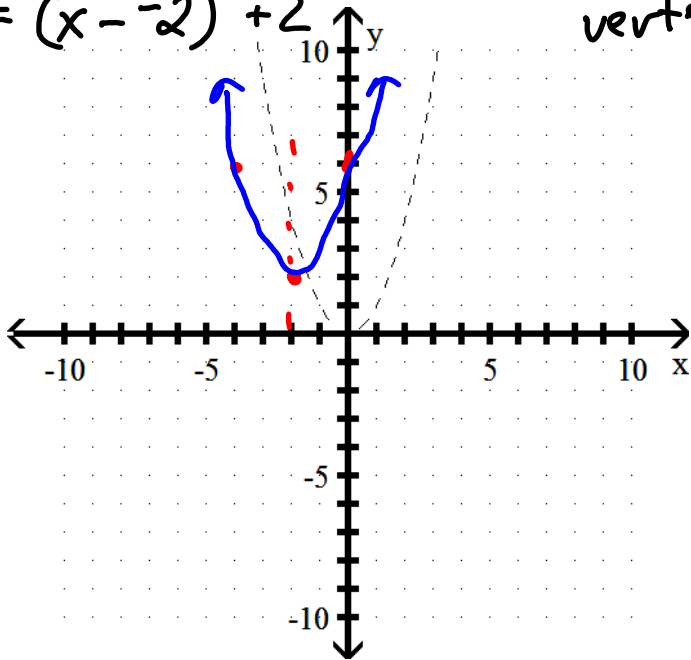


x	y
7	0
4	9
5	4

shifted 7 units  
Right

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

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



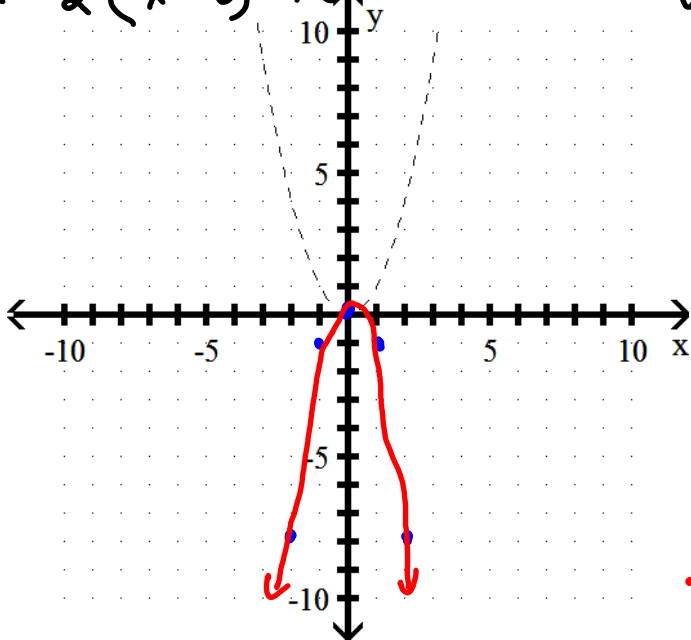
vertex  $(-2, 2)$

x	y
-2	2
0	6

shifted 2 up  
2 left

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

$f(x) = -2(x - 0)^2 + 0$



vertex  $(0, 0)$

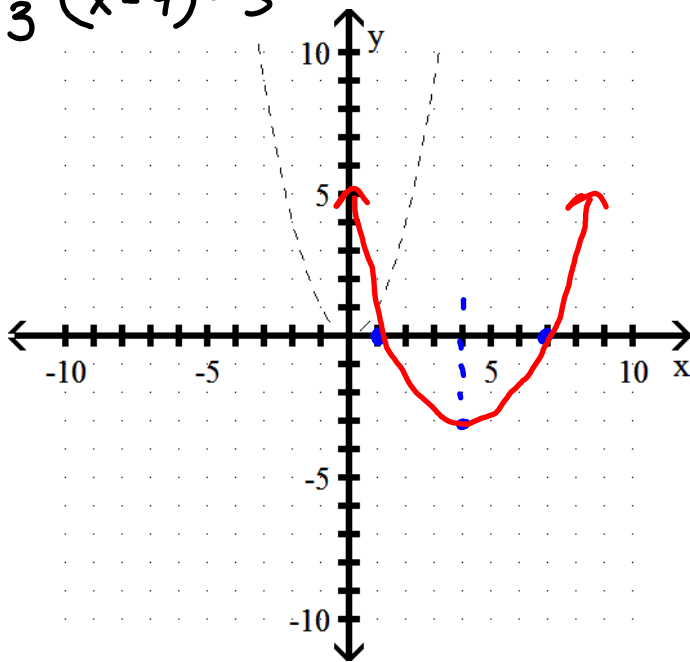
x	y
0	0
1	-2
2	-8

narrower  
flipped down

$$7) \quad h(x) = \frac{1}{3}(x-4)^2 - 3$$

$$h(x) = \frac{1}{3}(x-4)^2 - 3$$

vertex  $(4, -3)$



x	y
4	-3
1	0

$$y = \frac{1}{3}(1-4)^2 - 3$$

$$y = \frac{1}{3}(-3)^2 - 3$$

$$y = \frac{1}{3}(0) - 3$$

$$y = 3 - 3 = 0$$

shifted 4 right  
3 down  
wider

Give the vertex and axis of symmetry.

$$8) \quad f(x) = x^2 + 1$$

$$f(x) = (x-0)^2 + 1$$

vertex  $(0, 1)$

axis of symmetry  $x = 0$

$$9) \quad f(x) = (x+5)^2 - 4$$

vertex:  $(-5, -4)$

axis of symmetry:  $x = -5$

$$10) \quad f(x) = -\frac{1}{4}(x+5)^2 - 4$$

vertex:  $(-5, -4)$

axis of symmetry:  $x = -5$