

**Core Algebra 2**  
**Worksheet 2.1-2.2B**

**Describe the transformation represented by the equation  $f(x) = a(x + h)^2 + k$ .**

1.  $f(x) = -(x + 2)^2 - 9$

left 2, down 9, reflection

2.  $f(x) = 3(x - 4)^2 + 8$

right 4, up 8, v. stretch 3

3.  $f(x) = -\frac{1}{4}(x - 3)^2 + 8$

right 3, up 8, v. shrink  $\frac{1}{4}$ , reflection

4.  $f(x) = -2(x + 6)^2 - 10$

left 6, down 10, v. stretch, reflection

**Write a function  $g$  which describes the transformation of  $f$ .**

5.  $f(x) = x^2$ ; right 4, reflection

$g(x) = (x - 4)^2$

$g(x) = -(x - 4)^2$

6.  $f(x) = (x - 1)^2$ ; right 3, up 5

$g(x) = (x - 4)^2$

$g(x) = (x - 4)^2 + 5$

7.  $f(x) = (x + 3)^2$ ; down 4, v. stretch by 2

$g(x) = (x + 3)^2 - 4$

$g(x) = 2(x + 3)^2 - 8$

8.  $f(x) = 2(x + 3)^2$ ; up 6, left 1, v. shrink by  $\frac{1}{2}$

$g(x) = 2(x + 3)^2 + 6$

$g(x) = 2(x + 4)^2 + 6$

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

9.  $f(x) = 4(x + 3)^2 + 5$ ; down 3, right 2, v. stretch by 2

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

$g(x) = 4(x + 1)^2 + 2$

$g(x) = 8(x + 1)^2 + 4$

10.  $f(x) = -3(x + 3)^2 - 2$ ; up 4, left 3, reflection

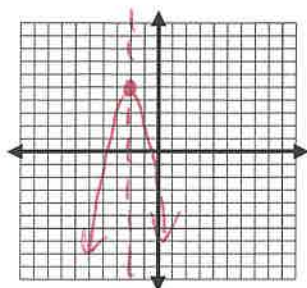
$g(x) = -3(x + 3)^2 + 2$

$g(x) = -3(x + 6)^2 + 2$

$g(x) = 3(x + 6)^2 - 2$

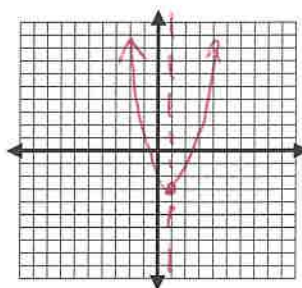
**Find the vertex, axis of symmetry, and then graph.**

11.  $f(x) = -3(x + 2)^2 + 5$



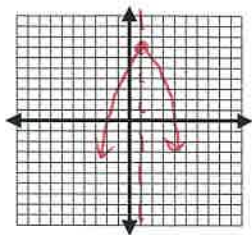
$(-2, 5)$   
 $x = -2$

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



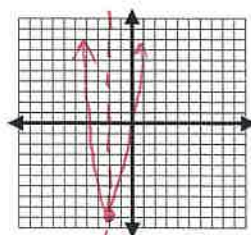
$(1, -3)$   
 $x = 1$

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



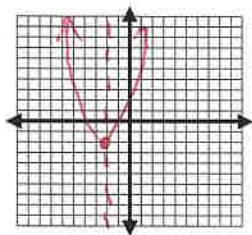
$(1, 7)$   
 $x = 1$

14.  $f(x) = 3(x + 2)^2 - 9$



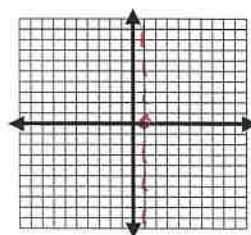
$(-2, -9)$   
 $x = -2$

15.  $f(x) = x^2 + 4x + 2$



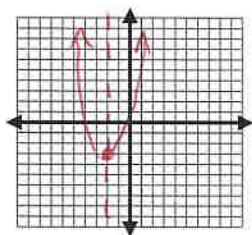
$\frac{-b}{2a} = \frac{-4}{2} = -2$   
 $x = -2$   
 $(-2, -2)$

16.  $f(x) = x^2 - 2x + 1$



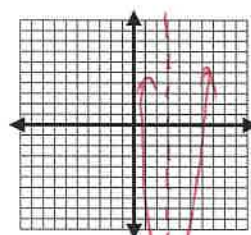
$\frac{-b}{2a} = \frac{2}{2} = 1$   
 $x = 1$   
 $(1, 0)$

17.  $f(x) = 2x^2 + 8x + 5$



$\frac{-b}{2a} = \frac{-8}{4} = -2$   
 $x = -2$   
 $(-2, -3)$

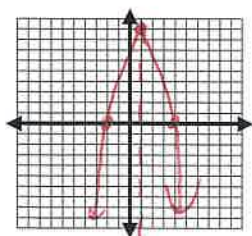
18.  $f(x) = 2x^2 - 12x - 3$



$\frac{-b}{2a} = \frac{12}{4} = 3$   
 $x = 3$   
 $(3, -21)$

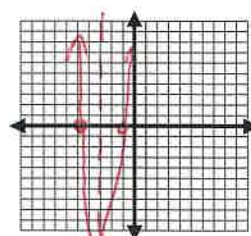
**Graph.** Find the x-intercepts, axis of symmetry, vertex, and the minimum or maximum value.

19.  $f(x) = -(x - 4)(x + 2)$



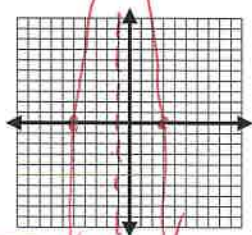
$(4, 0)$   $(-2, 0)$   
 $x = 1$   
 $(1, 9)$

20.  $f(x) = 3(x + 1)(x + 5)$



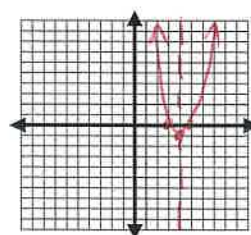
$(-1, 0)$   $(-5, 0)$   
 $x = -3$   
 $(-3, -12)$

21.  $f(x) = -2(x - 3)(x + 5)$



$(3, 0)$   $(-5, 0)$   
 $x = -1$   
 $(-1, 32)$

22.  $f(x) = (x - 3)(x - 5)$



$(3, 0)$   $(5, 0)$   
 $x = 4$   
 $(4, -1)$