

# Chapter 2 Review A

Describe the transformation of  $f(x) = x^2$  represented by  $g$ . Then graph each function.

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



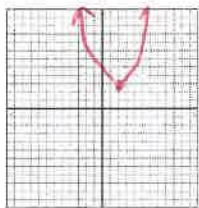
Left 2, up 4,  
V.St 3, Reflection

2.  $g(x) = \frac{1}{2}(x+5)^2 - 3$



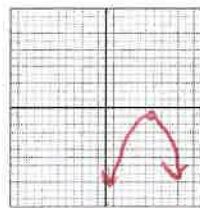
Left 5, down 3,  
V.Sh 1/2

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



Right 2, up 3,  
V.St 2

4.  $g(x) = -(x-6)^2 - 1$



Right 6, down 1  
Reflection

5. The graph of  $g$  is a translation 7 units up, followed by a vertical stretch of 2 of the graph  $f(x) = x^2$ . Write a rule for  $g$ .

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

$$g(x) = x^2 + 7$$

$$g(x) = 2x^2 + 14$$

6. The graph of  $g$  is a translation 1 unit right and 2 units down, followed by a reflection across the  $x$ -axis of the graph  $f(x) = x^2 + 1$ . Write a rule for  $g$ .

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

$$g(x) = (x-1)^2 - 1$$

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

7. The graph of  $g$  is a translation 4 units left, followed by a vertical stretch of 3 of the graph  $f(x) = (x+1)^2 - 3$ . Write a rule for  $g$ .

$$f(x) = (x+1)^2 - 3$$

$$g(x) = (x+5)^2 - 3$$

$$g(x) = 3(x+5)^2 - 15$$

8. The graph of  $g$  is a translation 2 units left and 3 units up, followed by a reflection across the  $x$ -axis of the graph  $f(x) = (x-2)^2 + 5$ . Write a rule for  $g$ .

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

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

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

9. The graph of  $g$  is a translation 5 units right, 2 units up, followed by a vertical shrink of  $\frac{1}{2}$  of the graph

$f(x) = 2(x+1)^2 - 4$ . Write a rule for  $g$ .

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

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

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

10. The graph of  $g$  is a translation 3 units right and 1 units up, vertical stretch of 2, followed by a reflection across the  $x$ -axis of the graph  $f(x) = 3(x-4)^2 + 3$ . Write a rule for  $g$ .

$$g(x) = 3(x-7)^2 + 3$$

$$g(x) = 3(x-7)^2 + 4$$

$$g(x) = 6(x-7)^2 + 8$$

$$g(x) = -6(x-7)^2 - 8$$

Find the vertex, the axis of symmetry, the minimum value or maximum value of the function, and the domain and range of the function.

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

Vertex: (4, -3) AS:  $x = 4$   
 Min or Max: -3  
 Domain:  $\mathbb{R}$  Range:  $x > 4$

12.  $h(x) = x^2 + 2x - 8$

$x = \frac{-b}{2a} = \frac{-2}{2} = -1$

Vertex: (-1, -9) AS:  $x = -1$   
 Min or Max: -9  
 Domain:  $\mathbb{R}$  Range:  $y \geq -9$

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

$x = \frac{-b}{2a} = \frac{-8}{4} = -2$

Vertex: (-2, -13) AS:  $x = -2$   
 Min or Max: -13  
 Domain:  $\mathbb{R}$  Range:  $y \geq -13$

14.  $h(x) = 3(x + 1)^2 + 4$

Vertex: (-1, 4) AS:  $x = -1$   
 Min or Max: 4  
 Domain:  $\mathbb{R}$  Range:  $y \geq 4$

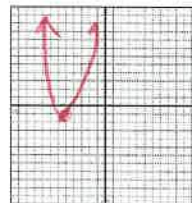
Graph the function.

15.  $f(x) = -(x - 1)(x - 5)$



x-intercepts: 1, 5  
 Vertex: (3, 4) AS:  $x = 3$

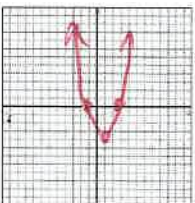
16.  $f(x) = 2x^2 + 24x + 71$



$x = \frac{-b}{2a} = \frac{-24}{4} = -6$

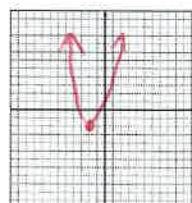
Vertex: (-6, -1) AS:  $x = -6$

17.  $f(x) = (x - 3)(x + 1)$



x-int: 3, -1 AS: ~~(3, 1)~~  
 Vertex: (1, -4)

18.  $f(x) = 3x^2 + 12x + 10$



$x = \frac{-b}{2a} = \frac{-12}{6} = -2$

x-intercepts: ~~\_\_\_\_\_~~  
 Vertex: (-2, -2) AS:  $x = -2$

Write the equation of the quadratic with the given characteristics for #19-26.

19. passes through (-5,6) and has a vertex (-9,-2)

$$y = a(x-h)^2 + k$$

$$6 = a(-5+9)^2 - 2$$

$$6 = 16a - 2$$

$$8 = 16a \quad a = \frac{1}{2}$$

$$y = \frac{1}{2}(x+9)^2 - 2$$

20. x-intercepts: -9 and 9; passes through (0,4)

$$y = a(x-p)(x-q)$$

$$4 = a(0+9)(0-9)$$

$$4 = -81a$$

$$-\frac{4}{81} = a$$

$$y = -\frac{4}{81}(x+9)(x-9)$$

21. x-intercepts: -5 and 5; passes through (0,-5)

$$y = a(x-p)(x-q)$$

$$-5 = a(0+5)(0-5)$$

$$-5 = -25a$$

$$\frac{1}{5} = a$$

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

22. passes through (6,2) and has a vertex (3,-4)

$$y = a(x-h)^2 + k$$

$$2 = a(6-3)^2 - 4$$

$$2 = 9a - 4$$

$$6 = 9a$$

$$a = \frac{2}{3}$$

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

23. passes through (9,1) and has a vertex (1,-3)

$$y = a(x-h)^2 + k$$

$$1 = a(9-1)^2 - 3$$

$$1 = 64a - 3$$

$$4 = 64a$$

$$a = \frac{1}{16}$$

$$y = \frac{1}{16}(x-1)^2 - 3$$

24. x-intercepts: -2 and 4; passes through (2,-16)

$$y = a(x-p)(x-q)$$

$$-16 = a(2+2)(2-4)$$

$$-16 = -8a$$

$$2 = a$$

$$y = 2(x+2)(x-4)$$

25. x-intercepts: -5 and 1; passes through (3,4)

$$y = a(x-p)(x-q)$$

$$4 = a(3+5)(3-1)$$

$$4 = 16a$$

$$\frac{1}{4} = a$$

$$y = \frac{1}{4}(x+5)(x-1)$$

26. passes through (10,-1) and has a vertex (-2,3)

$$y = a(x-h)^2 + k$$

$$-1 = a(10+2)^2 + 3$$

$$-1 = 144a + 3$$

$$-4 = 144a$$

$$-\frac{1}{36} = a$$

$$y = -\frac{1}{36}(x+2)^2 + 3$$

