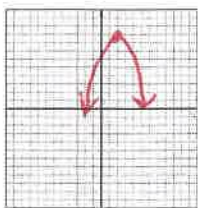


# Chapter 2 Review B

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

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



$x = \frac{-b}{2a} = \frac{-4}{-2} = 2$   
 $(2, 9)$   
 Right 2, up 9, Reflect

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



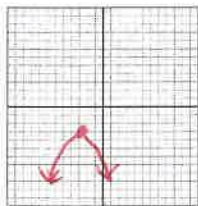
Right 4, Up 2  
 v. sh  $\frac{1}{4}$

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



Left 1, Down 4  
 v. st 2

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



Left 3, Down 3  
 Reflection

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

$g(x) = x^2 - 5$   
 $g(x) = 2x^2 - 10$

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

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

7. The graph of  $g$  is a translation 6 units left, followed by a vertical stretch of 2 of the graph  $f(x) = (x + 2)^2 - 3$ . Write a rule for  $g$ .

$g(x) = (x + 8)^2 - 3$   
 $g(x) = 2(x + 8)^2 - 6$

8. The graph of  $g$  is a translation 4 units left and 5 units up, followed by a reflection across the  $x$ -axis of the graph  $f(x) = (x - 1)^2 + 4$ . Write a rule for  $g$ .

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

9. The graph of  $g$  is a translation 7 units right, 6 units up, followed by a vertical shrink of  $\frac{1}{2}$  of the graph

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

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

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

$g(x) = -3(x - 7)^2 + 8$   
 $g(x) = -6(x - 7)^2 + 20$   
 $g(x) = -3(x - 7)^2 + 10$   
 $g(x) = 6(x - 7)^2 - 20$

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

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

12.  $h(x) = 2x^2 + 8x - 7$

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

Vertex:  $(-2, -15)$  AS:  $x = -2$   
 Min or Max:  $-15$   
 Domain:  $\mathbb{R}$  Range:  $y \geq -15$

13.  $f(x) = 3x^2 + 12x - 7$

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

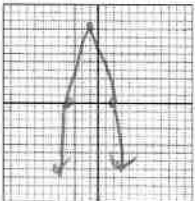
Vertex:  $(-2, -19)$  AS:  $x = -2$   
 Min or Max:  $-19$   
 Domain:  $\mathbb{R}$  Range:  $y \geq -19$

14.  $h(x) = 3(x + 2)^2 + 5$

Vertex:  $(-2, 5)$  AS:  $x = -2$   
 Min or Max:  $5$   
 Domain:  $\mathbb{R}$  Range:  $y \geq 5$

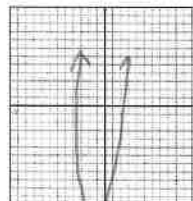
Graph the function.

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



x-intercepts:  $-4, 2$   
 Vertex:  $(-1, 9)$  AS:  $x = -1$

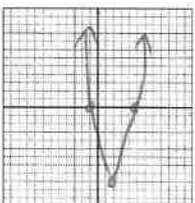
16.  $f(x) = 2x^2 + 4x - 13$



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

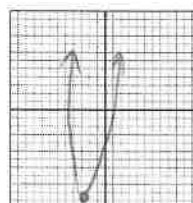
Vertex:  $(-1, -15)$  AS:  $x = -1$

17.  $f(x) = (x - 5)(x + 1)$



x-int:  $5, -1$  AS:  $x = 2$   
 Vertex:  $(2, -9)$

18.  $f(x) = 3x^2 + 18x + 16$



$x = \frac{-b}{2a} = \frac{-18}{6} = -3$

x-intercepts: ~~.....~~  
 Vertex:  $(-3, -11)$  AS:  $x = -3$

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

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

$$\begin{aligned}y &= a(x-h)^2 + k \\4 &= a(-3+2)^2 + 3 & y &= (x+2)^2 + 3 \\4 &= a + 3 \\1 &= a\end{aligned}$$

21. x-intercepts: -3 and 3; passes through (0,-6)

$$\begin{aligned}y &= a(x-p)(x-q) \\-6 &= a(0+3)(0-3) \\-6 &= -9a & y &= \frac{2}{3}(x+3)(x-3) \\-\frac{2}{3} &= a\end{aligned}$$

23. passes through (3,11) and has a vertex (1,3)

$$\begin{aligned}y &= a(x-h)^2 + k & 8 &= 4a \\11 &= a(3-1)^2 + 3 & 2 &= a \\11 &= 4a + 3 & y &= 2(x-1)^2 + 3\end{aligned}$$

25. x-intercepts: 4 and -2; passes through (2,5)

$$\begin{aligned}y &= a(x-p)(x-q) \\5 &= a(2-4)(2+2) \\5 &= -8a \\-\frac{5}{8} &= a \\y &= -\frac{5}{8}(x-4)(x+2)\end{aligned}$$

20. x-intercepts: -3 and 4; passes through (-1,2)

$$\begin{aligned}y &= a(x-p)(x-q) \\2 &= a(-1+3)(-1-4) & y &= -\frac{1}{5}(x+3)(x-4) \\2 &= -10a \\-\frac{1}{5} &= a\end{aligned}$$

22. passes through (1,3) and has a vertex (2,-4)

$$\begin{aligned}y &= a(x-h)^2 + k \\3 &= a(1-2)^2 - 4 & y &= 7(x-2)^2 - 4 \\3 &= a - 4 \\7 &= a\end{aligned}$$

24. x-intercepts: -3 and 1; passes through (2,7)

$$\begin{aligned}y &= a(x-p)(x-q) \\7 &= a(2+3)(2-1) & y &= \frac{7}{5}(x+3)(x-1) \\7 &= 5a \\-\frac{7}{5} &= a\end{aligned}$$

26. passes through (-2,8) and has a vertex (-4,5)

$$\begin{aligned}y &= a(x-h)^2 + k \\8 &= a(-2+4)^2 + 5 \\8 &= 4a + 5 \\3 &= 4a \\-\frac{3}{4} &= a \\y &= -\frac{3}{4}(x+4)^2 + 5\end{aligned}$$

