Worksheet 5.1 Describing & Translating Quadratic Equations

1-12: Complete the chart describing each pair of quadratic equations comparing vertices (same/different AND maximum/minimum) and shape (same/different)

#	Quadratics	Opens	I a I	Vertex	Max/Min	Description
1	$y = 2(x-2)^2 + 7$	up	2	(2, 7)	min	Both parabolas turn up, sharing the same vertices which are minimums but they have different shapes.
	$y = 3(x-2)^2 + 7$	up	3	(2, 7)	min	
2	$y = -\frac{1}{2}(x-5)^2 - 3$					
	$y = 4(x+5)^2 - 3$					
3	$y = -\frac{1}{3}x^2 + 8$					
	$y = -\frac{1}{3}x^2 + 8$					
4	$y = 8(x-2)^2 + 8$					
	$y = 8(x-2)^2 - 8$					
5	$y = \frac{2}{5}(x+1)^2 - 4$					
	$y = -\frac{2}{5}(x+1)^2 - 4$					
6	$y = 2(x-3)^2 + 5$					
	$y = \frac{1}{2}(x+5)^2 - 3$					
7	$y = 3(x-10)^2 + 11$					
	$y = -4(x-10)^2 + 11$					
8	$y = 2(x-6)^2 + 7$					
	$y = -2(x-6)^2 + 7$					
9	$y = -5(x-8)^2 + 1$					
	$y = -6(x-8)^2 - 1$					
10	$y = -\frac{1}{6}(x-3)^2 + 6$					
	$y = -6(x-3)^2 + 6$					
11	$y = -\frac{1}{4}(x-2)^2 + 5$					
	$y = -\frac{1}{4}(x+2)^2 + 5$					
12	$y = 7(x-4)^2$					
	$y = 7(x-4)^2$					

13-20: Describe the translation from the first quadratic equation to the second quadratic equation.

13. $y = 2(x-1)^2 + 3$; $y = 2(x+1)^2 - 3$

14. $y = \frac{3}{4}(x-5)^2 - 10$; $y = \frac{3}{4}(x-8)^2 - 2$

15. $y = (x+4)^2 + 7$; $y = (x-8)^2 - 5$

16. $y = -3(x-6)^2 + 9$; $y = -3(x-14)^2 + 4$

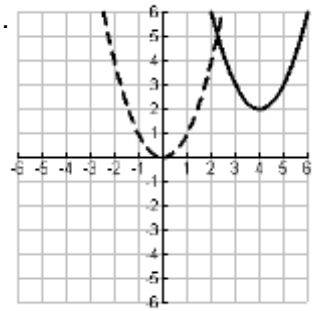
17. $y = x^2 + 5$; $y = (x+8)^2 + 5$

18. $y = -(x+2)^2$; $y = -(x-2)^2 + 9$

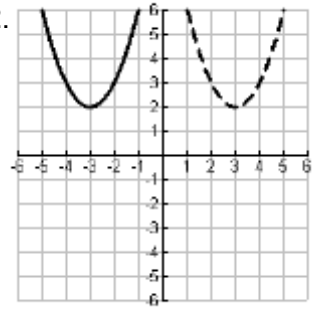
19. $y = -\frac{1}{2}(x-3)^2 + 6$; $y = -\frac{1}{2}x^2 + 7$

20. $y = 4x^2$; $y = 4(x+3)^2 + 15$

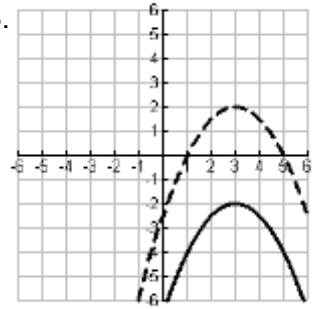
21-25: Write the equation of the translated quadratic graph (solid) given the original quadratic equation (dashed).

21. 

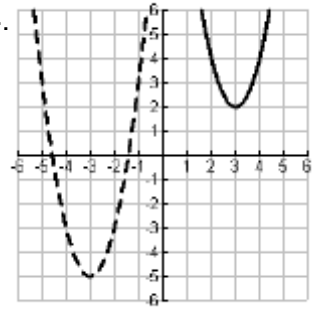
$y = x^2$

22. 

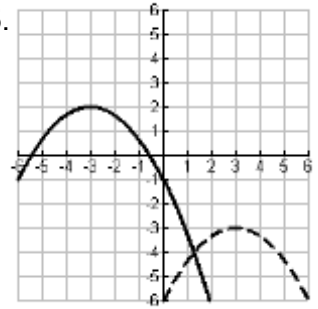
$y = (x-3)^2 + 2$

23. 

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

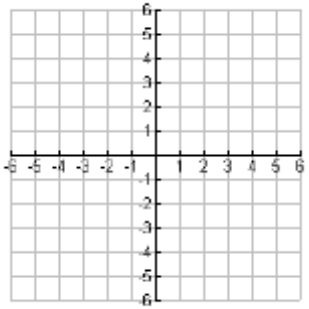
24. 

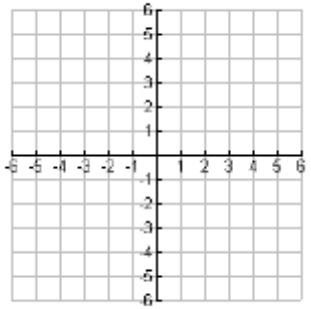
$y = 2(x+3)^2 - 5$

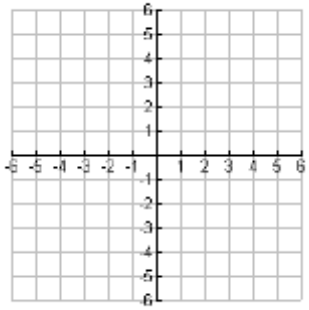
25. 

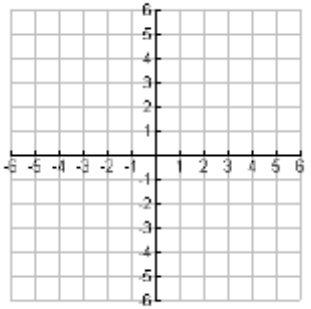
$y = -\frac{1}{3}(x+3)^2 - 3$

26-30: Graph each quadratic equation (as a solid line) by first graphing its parent function (as a dashed line) and then translating it.

26. $y = (x-2)^2 - 5$ 

27. $y = -(x+3)^2 + 1$ 

28. $y = 2(x-3)^2 + 2$ 

29. $y = \frac{1}{2}(x-2)^2 - 4$ 

30. $y = -2(x+1)^2 + 5$