Name _____ Class _____ Date _____

Practice 10-2

Quadratic Functions

Find the equation of the axis of symmetry and the coordinates of the vertex of the graph of each function.

1. $y = x^2 - 10x + 2$
2. $y = x^2 + 12x - 9$
3. $y = -x^2 + 2x + 1$
4. $y = 3x^2 + 18x + 9$
5. $y = 3x^2 + 3$
6. $y = 16x - 4x^2$
7. $y = 0.5x^2 + 4x - 2$
8. $y = -4x^2 + 24x + 6$
9. $y = -1.5x^2 + 6x$

Graph each function. Label the axis of symmetry and the vertex.

10. $y = x^2 - 6x + 4$
11. $y = x^2 + 4x - 1$
12. $y = x^2 + 10x + 14$
13. $y = x^2 + 2x + 1$
14. $y = -x^2 - 4x + 4$
15. $y = -4x^2 + 24x + 13$
16. $y = -2x^2 - 8x + 5$
17. $y = 4x^2 - 16x + 10$
18. $y = -x^2 + 6x + 5$
19. $y = 4x^2 + 8x$
20. $y = -3x^2 + 6$
21. $y = 6x^2 + 48x + 98$

Graph each quadratic inequality.

22. $y > x^2 + 1$
23. $y \geq x^2 - 4$
24. $y < -x^2 + 1$
25. $y > x^2 + 6x + 3$
26. $y < x^2 - 4x + 4$
27. $y < -x^2 + 2x - 3$
28. $y \geq -2x^2 - 8x - 5$
29. $y \leq -3x^2 + 6x + 1$
30. $y \geq 2x^2 - 4x - 3$

31. You and a friend are hiking in the mountains. You want to climb to a ledge that is 20 ft above you. The height of the grappling hook you throw is given by the function $h = -16t^2 - 32t + 5$. What is the maximum height of the grappling hook? Can you throw it high enough to reach the ledge?

32. The total profit made by an engineering firm is given by the function $p = x^2 - 25x + 5000$. Find the minimum profit made by the company.

33. You are trying to dunk a basketball. You need to jump 2.5 ft in the air to dunk the ball. The height that your feet are above the ground is given by the function $h = -16t^2 + 12t$. What is the maximum height your feet will be above the ground? Will you be able to dunk the basketball?