Name_____ Date _____

## 2.2 Practice A

**In Exercises 1–12, graph the function. Label the vertex and axis of symmetry.**

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

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

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

4. $h(x) = (x - 3)^2 - 2$

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

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

7. $y = x^2 - 2x + 1$

8. $y = 3x^2 + 6x + 1$

9. $y = -3x^2 + 6x + 4$

10. $f(x) = -x^2 + 6x - 3$

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

12. $f(x) = 5x^2 - 4$

13. Explain why you cannot use the axes of symmetry to distinguish between the quadratic functions $y = 3x^2 + 12x + 1$ and $y = x^2 + 4x + 5$.

14. Which function represents the parabola with the narrowest graph? Explain your reasoning.

  **A.** $y = x^2 + 3$

  **B.** $y = 0.5x^2 - 2$

  **C.** $y = 3(x + 2)^2$

  **D.** $y = -2x^2 + 1$

**In Exercises 15–18, find the minimum or maximum value of the function. Describe the domain and range of the function, and where the function is increasing and decreasing.**

15. $y = 5x^2 + 2$

16. $y = 4x^2 - 3$

17. $y = -x^2 + 4x - 1$

18. $f(x) = -2x^2 + 4x + 9$

19. The number of customers in a grocery store is modeled by the function $y = -x^2 + 10x + 50$, where $y$ is the number of customers in the store and $x$ is the number of hours after 7:00 A.M.

  **a.** At what time is the maximum number of customers in the store?

  **b.** How many customers are in the store at the time in part (a)?