Name _____ Date _____

3.2 Practice A

In Exercises 1–3, graph the function. Compare the graph to the graph of
$f(x) = x^2$.

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

2. $h(x) = x^2 + 7$

3. $k(x) = x^2 - 2$

In Exercises 4–6, graph the function. Compare the graph to the graph of
$f(x) = x^2$.

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

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

6. $j(x) = 3x^2 - 2$

In Exercises 7 and 8, describe the transformation from the graph of *f* to the graph of *g*. Then graph *f* and *g* in the same coordinate plane. Write an equation that represents *g* in terms of *x*.

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

   $g(x) = f(x) - 3$

8. $f(x) = \frac{1}{3}x^2 - 1$

   $g(x) = f(x) + 4$

In Exercises 9–12, find the zeros of the function.

9. $y = x^2 - 4$

10. $y = x^2 - 64$

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

12. $f(x) = 2x^2 - 50$

13. You drop a stick from a height of 64 feet. At the same time, your friend drops a stick from a height of 144 feet.

   a. What does the function $h(t) = -16t^2 + 64$ represent in this situation?

   b. After how many seconds does your stick hit the ground?

   c. How many seconds later does your friend's stick hit the ground?

In Exercises 14–17, sketch a parabola with the given characteristics.

14. The parabola opens down and the vertex is $(0, 2)$.

15. The vertex is $(0, -4)$ and one of the *x*-intercepts is 3.

16. The related function is decreasing when $x < 0$ and the zeros are -2 and 2.

17. The lowest point on the parabola is $(0, -1)$.

18. Your friend claims that in the equation $y = ax^2 + c$, the vertex changes when the value of *c* changes. Is your friend correct? Explain your reasoning.