Name_____ Date _____

3.2 Practice B

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

1. $g(x) = x^2 + 5$ **2.** $h(x) = x^2 + 10$ **3.** $j(x) = x^2 - 5$

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

4. $g(x) = -2x^2 + 4$ **5.** $h(x) = -\frac{1}{4}x^2 - 1$ **6.** $k(x) = \frac{1}{3}x^2 + 5$

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

8. $f(x) = 2x^2 + 7$
$g(x) = f(x) - 9$

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

9. $y = -x^2 + 81$ **10.** $y = 3x^2 - 75$

11. $f(x) = -5x^2 + 20$ **12.** $f(x) = -12x^2 + 27$

13. The function $y = -16x^2 + 100$ represents the height y (in feet) of a pencil x seconds after falling out the window of a school building. Find and interpret the x- and y-intercepts.

14. The paths of water from three different waterfalls are given below. Each function gives the height h (in feet) and the horizontal distance d (in feet) of the water.

Waterfall 1: $h = -2.4d^2 + 1.5$

Waterfall 2: $h = -2.4d^2 + 3$

Waterfall 3: $h = -1.4d^2 + 3$

a. Which waterfall drops water from the lowest point?

b. Which waterfall sends water the farthest horizontal distance?

c. What do you notice about the paths of Waterfall 1 and Waterfall 2?