Name_____ Date _____

3.7 Practice B

In Exercises 1 and 2, describe the transformation of *f* represented by *g*. Then graph each function.

1. $f(x) = x^4,\ g(x) = (x - 3)^4 - 2$

2. $f(x) = x^5,\ g(x) = (x - 1)^5 + 4$

In Exercises 3–6, describe the transformation of *f* represented by *g*. Then graph each function.

3. $f(x) = x^5,\ g(x) = -3x^5$

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

5. $f(x) = x^4,\ g(x) = \frac{1}{3}x^4 - 3$

6. $f(x) = x^4,\ g(x) = \frac{2}{3}(x + 3)^4$

In Exercises 7 and 8, write a rule for *g* and then graph each function. Describe the graph of *g* as a transformation of the graph of *f*.

7. $f(x) = x^3 - 4x^2 + 2,\ g(x) = -\frac{1}{4}f(x)$

8. $f(x) = x^4 + x + 1,\ g(x) = f(-x) + 2$

9. Describe and correct the error in describing the transformation of the graph of $f(x) = x^4$ represented by the graph of $g(x) = 4x^4 + 3$.

> ✗ The graph of g is a vertical shrink by a factor of $\frac{1}{4}$, followed by a translation 3 units up of the graph of f.

In Exercises 10 and 11, write a rule for *g* that represents the indicated transformations of the graph of *f*.

10. $f(x) = x^3 - 3x^2 + 2$; horizontal stretch by a factor of 3 and a translation 3 units up, followed by a reflection in the x-axis

11. $f(x) = 3x^5 - x^3 + 5x^2 + 1$; reflection in the y-axis and a vertical shrink by a factor of $\frac{1}{2}$, followed by a translation 1 unit up

12. The volume V (in cubic inches) of a rectangular box is given by $V = 2x^3 + 9$.

a. The function $W(x) = V\left(\frac{x}{12}\right)$ gives the volume (in cubic feet) of the box when x is measured in inches. Write a rule for W. Find and interpret $W(6)$.

b. The function $Z(x) = W\left(\frac{x}{3}\right)$ gives the volume (in cubic yards) of the box when x is measured in inches. Write a rule for Z.