In Exercises 1–6, use the properties of rational exponents to simplify the expression.

4. $\dfrac{10}{10^{1/4}}$ 5. $\left(\dfrac{6^5}{9^5}\right)^{-1/5}$ 6. $\left(7^{-3/4} \cdot 7^{1/4}\right)^{-1}$

In Exercises 13–18, write the expression in simplest form.

13. $\sqrt[4]{208}$ 14. $\dfrac{\sqrt[3]{9}}{\sqrt[3]{4}}$ 15. $\sqrt{\dfrac{5}{27}}$

16. $\dfrac{1}{2+\sqrt{3}}$ 17. $\dfrac{6}{4-\sqrt{5}}$ 18. $\dfrac{8}{\sqrt{2}+\sqrt{5}}$

In Exercises 7–12, describe the transformation of *f* represented by *g*. Then graph each function.

7. $f(x) = \sqrt{x}; g(x) = 4\sqrt{x-2}$ 8. $f(x) = \sqrt[3]{x}; g(x) = \sqrt[3]{x-5} - 1$

In Exercises 8–13, solve the equation. Check your solution(s).

8. $x - 8 = \sqrt{4x}$ 9. $\sqrt{2x-14} = x - 7$

In Exercises 3–5, find $(fg)(x)$ and $\left(\dfrac{f}{g}\right)(x)$ and state the domain of each.

Then evaluate fg and $\dfrac{f}{g}$ for the given value of x.

4. $f(x) = 3x^2; g(x) = 5x^{1/4}; x = 16$

5. $f(x) = 10x^{5/6}; g(x) = 2x^{1/3}; x = 64$

In Exercises 4–6, find the inverse of the function. Then graph the function and its inverse.

4. $f(x) = 4x$ 5. $f(x) = 4x - 1$ 6. $f(x) = \frac{1}{2}x - 5$

In Exercises 14–16, solve the equation. Check your solution(s).

14. $2x^{2/3} = 18$ 15. $x^{3/4} + 10 = 0$ 16. $(x+12)^{1/2} = x$

In Exercises 57–64, write the expression in simplest form. Assume all variables are positive. *(See Example 7.)*

57. $\sqrt{81a^7b^{12}c^9}$ 58. $\sqrt[3]{125r^4s^9t^7}$