

6.3 Practice A

In Exercises 1–6, simplify the expression, if possible.

1. $\frac{3x^2}{5x^2 + 2x}$

2. $\frac{6x^4 - x^3}{2x^4}$

3. $\frac{x^2 - 4x - 5}{x^2 - 7x + 10}$

4. $\frac{x^2 - 3x}{x^2 + 5x + 6}$

5. $\frac{x^2 - x - 2}{x^3 - 8}$

6. $\frac{x^2 - 3x - 4}{x^3 + 1}$

In Exercises 7–12, find the product.

7. $\frac{54x^4y^2}{y^4} \cdot \frac{x^3y^2}{9x^5y^3}$

8. $\frac{x^3(x+2)}{x-1} \cdot \frac{(x-1)(x-3)}{x^4}$

9. $\frac{x^2(x-5)}{x+7} \cdot \frac{(x+7)(x-1)}{4x^2}$

10. $\frac{x^2 - 5x}{x + 3} \cdot \frac{x^2 + 4x + 3}{x}$

11. $\frac{x^2 + 3x}{x - 2} \cdot \frac{x^2 - 5x + 6}{4x}$

12. $\frac{x^2 - 4x - 5}{x^2 + 6x + 9} \cdot \frac{2x^2 + 6x}{x^2 + 3x + 2}$

13. Compare the function $f(x) = \frac{(4x+1)(x-5)}{(4x+1)}$ to the function $g(x) = x - 5$.

In Exercises 14–17, find the quotient.

14. $\frac{28x^4y}{y^7} \div \frac{y^9}{2x^5}$

15. $\frac{x^2 - x - 6}{3x^4 + 6x^3} \div \frac{x - 3}{6x^3}$

16. $\frac{4x^2 + 12x}{x^2 + 2x - 3} \div \frac{4x}{5x - 5}$

17. $\frac{x^2 + 5x - 14}{x + 3} \div (x^2 - 4x + 4)$

18. Manufacturers often package products in a way that uses the least amount of material. One measure of the efficiency of a package is the ratio of its surface area S to its volume V . The smaller the ratio, the more efficient the packaging. A company makes a cylindrical can to hold popcorn. The company is designing a new can with the same height h and twice the radius r of the old can.

a. Write an expression for the efficiency ratio $\frac{S}{V}$.

b. Find the efficiency ratio for each can.

c. Did the company make a good decision by creating the new can? Explain.