Name_____ Date _____

7.3 Practice A

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

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

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

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

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

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

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

In Exercises 7–12, find the product.

7. $\dfrac{54x^4y^2}{y^4} \bullet \dfrac{x^3y^2}{9x^5y^3}$

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

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

10. $\dfrac{x^2 - 5x}{x + 3} \bullet \dfrac{x^2 + 4x + 3}{x}$

11. $\dfrac{x^2 + 3x}{x - 2} \bullet \dfrac{x^2 - 5x + 6}{4x}$

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

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

In Exercises 14–17, find the quotient.

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

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

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

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

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 to its volume. 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 $\dfrac{S}{V}$, where S is the surface area of the can and V is the volume of the can.

b. Find the efficiency ratio for each can.

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