

## 8-4

## Practice

Form G

Simplify each rational expression. State any restrictions on the variables.

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

2.  $\frac{2y}{y^2+6y}$

3.  $\frac{20+40x}{20x}$

4.  $\frac{7x-28}{x^2-16}$

5.  $\frac{3y^2-3}{y^2-1}$

6.  $\frac{3x^2-12}{x^2-x-6}$

7.  $\frac{x^2+3x-18}{x^2-36}$

8.  $\frac{x^2+13x+40}{x^2-2x-35}$

Multiply. State any restrictions on the variables.

9.  $\frac{5a}{5a+5} \cdot \frac{10a+10}{a}$

10.  $\frac{2x+4}{10x} \cdot \frac{15x^2}{x+2}$

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

12.  $\frac{x^2-6x}{x^2+36} \cdot \frac{x+6}{x^2}$

13.  $\frac{5y-20}{3y+15} \cdot \frac{7y+35}{10y+40}$

14.  $\frac{x-2}{(x+2)^2} \cdot \frac{x+2}{2x-4}$

15.  $\frac{3x^3}{x^2-25} \cdot \frac{x^2+6x+5}{x^2}$

16.  $\frac{y^2-2y}{y^2+7y-18} \cdot \frac{y^2-81}{y^2-11y+18}$

Divide. State any restrictions on the variables.

17.  $\frac{7x^4}{24y^5} \div \frac{21x}{12y^4}$

18.  $\frac{6x+6}{7} \div \frac{4x+4}{x-2}$

19.  $\frac{5y}{2x^2} \div \frac{5y^2}{8x^2}$

20.  $\frac{3y+3}{6y+12} \div \frac{18}{5y+5}$

21.  $\frac{y^2-49}{(y-7)^2} \div \frac{5y+35}{y^2-7y}$

22.  $\frac{x^2+10x+16}{x^2-6x-16} \div \frac{x+8}{x^2-64}$

23.  $\frac{y^2-5y+4}{y^2-1} \div \frac{y^2-9}{y^2+5y+4}$

24.  $\frac{x^2-4}{x^2+6x+9} \div \frac{x^2+4x+4}{x^2-9}$

## 8-4

**Practice** (continued)

Form G

- 25.** A farmer must decide whether to build a cylindrical grain silo or a rectangular grain silo. The cylindrical silo has radius  $r$ . The rectangular silo has width  $r$  and length  $2r$ . Both silos have the same height  $h$ .
- Write and simplify an expression for the ratio of the volume of the cylindrical silo to its surface area, including the circular floor and ceiling.
  - Write and simplify an expression for the ratio of the volume of the rectangular silo to its surface area, including the rectangular floor and ceiling.
  - Compare the ratios of volume to surface area for the two silos.
  - Compare the volumes of the two silos.
  - Reasoning** Assume the average cost of construction materials per square foot of surface area is the same for either silo. How can you measure the cost-effectiveness of each silo?

**Simplify each rational expression. State any restrictions on the variables.**

**26.**  $\frac{2x^2 + 11x + 5}{3x^2 + 17x + 10}$

**27.**  $\frac{6x^2 + 5xy - 6y^2}{3x^2 - 5xy + 2y^2}$

**Multiply or divide. State any restrictions on the variables.**

**28.**  $\frac{x^2 + 2x + 1}{x^2 - 1} \cdot \frac{x^2 + 3x + 2}{x^2 + 4x + 4}$

**29.**  $\frac{x^2 - 3x - 10}{2x^2 - 11x + 5} \div \frac{x^2 - 5x + 6}{2x^2 - 7x + 3}$

- 30. Reasoning** A rectangle has area  $\frac{10b}{6b-6}$  and length  $\frac{b+2}{2b-2}$ . Write an expression for the width of the rectangle.

- 31. Open-Ended** Write three rational expressions that simplify to  $\frac{x+1}{x-1}$ .