

**8-4****Practice**

Form G

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

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

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

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

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

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

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

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

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

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

**Divide. State any restrictions on the variables.**

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

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

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

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

**Rational Expressions**

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.**

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

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

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

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