

4.3 How can I rewrite it?



Multiplying and Dividing Rational Expressions

You know how to multiply and divide fractions. But what if the fractions have variables in them? That is, what if they are rational expressions? Is the process the same? Today you will learn how to multiply and divide rational expressions and will continue to practice simplifying rational expressions.

- **3-85.** Review your work from yesterday by simplifying the rational expression below using a “Giant One.” What are the excluded values of x ? (That is, what values can x not be?)

$$\frac{3x^2+11x-4}{2x^2+11x+12}$$

- **3-86.** With your team, review your responses to homework problem 3-82. Verify that everyone obtained the same answers and be prepared to share with the class how you multiplied and divided the fractions below.

$$\frac{2}{3} \cdot \frac{9}{14} \qquad \frac{3}{5} \div \frac{12}{25}$$

- **3-87.** Use your understanding of multiplying and dividing fractions to rewrite the expressions below. Then look for “Giant Ones” and simplify. For each rational expression, also state any values of the variables that would make the denominator zero.

a. $\frac{4x+3}{x-5} \cdot \frac{x-5}{x+3}$

b. $\frac{x+2}{9x-1} \div \frac{2x+1}{9x-1}$

c. $\frac{2m+3}{3m-2} \cdot \frac{7+4m}{3+2m}$

d. $\frac{(y-2)^3}{3y} \cdot \frac{y+5}{(y+2)(y-2)}$

e. $\frac{15x^3}{3y} \div \frac{10x^2y}{4y^2}$

f. $\frac{(5x-2)(3x+1)}{(2x-3)^2} \div \frac{(5x-2)(x-4)}{(x-4)(2x-3)}$

• **3-88. PUTTING IT ALL TOGETHER**

Multiply or divide the expressions below. Leave your answers as simplified as possible. For each rational expression, assume the denominator is not zero.

a. $\frac{20}{22} \cdot \frac{14}{35}$

b. $\frac{12}{40} \div \frac{15}{6}$

c. $\frac{5x-15}{3x^2+10x-8} \div \frac{x^2+x-12}{3x^2-8x+4}$

d. $\frac{12x-18}{x^2-2x-15} \cdot \frac{x^2-x-12}{3x^2-9x-12}$

e. $\frac{5x^2+34x-7}{10x} \cdot \frac{5x}{x^2+4x-21}$

f. $\frac{2x^2+x-10}{x^2+2x-8} \div \frac{4x^2+20x+25}{x+4}$