

## Section 7.2: MULTIPLYING AND DIVIDING RATIONAL EXPRESSIONS

When you are done with your homework you should be able to...

- $\pi$  Multiply rational expressions
- $\pi$  Divide rational expressions

WARM-UP:

Simplify:

a.  $\frac{a^2 - 2ab + b^2}{a^2 - b^2}$

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

**MULTIPLYING RATIONAL EXPRESSIONS**

If \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ are polynomials, where \_\_\_\_\_ and \_\_\_\_\_, then

The \_\_\_\_\_ of two \_\_\_\_\_ is the \_\_\_\_\_ of their \_\_\_\_\_, divided by the \_\_\_\_\_ of their \_\_\_\_\_.

## STEPS FOR MULTIPLYING RATIONAL EXPRESSIONS

1. \_\_\_\_\_ all \_\_\_\_\_ and \_\_\_\_\_.
2. \_\_\_\_\_ and \_\_\_\_\_ by  
common \_\_\_\_\_.
3. \_\_\_\_\_ the remaining factors in the \_\_\_\_\_  
and \_\_\_\_\_ the remaining factors in the \_\_\_\_\_.

Example 1: Multiply.

a.  $\frac{x-5}{3} \cdot \frac{18}{x-8}$

c.  $\frac{9y+21}{y^2-2y} \cdot \frac{y-2}{3y+7}$

b.  $\frac{x}{5} \cdot \frac{30}{x-4}$

d.  $\frac{x^2+5x+6}{x^2+x-6} \cdot \frac{x^2-9}{x^2-x-6}$

## DIVIDING RATIONAL EXPRESSIONS

If \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ are polynomials, where \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_, then

The \_\_\_\_\_ of two \_\_\_\_\_ is the \_\_\_\_\_ of the \_\_\_\_\_ expression and the \_\_\_\_\_ of the \_\_\_\_\_.

Example 2: Divide.

a.  $\frac{x}{3} \div \frac{3}{8}$

c.  $\frac{y^2 - 2y}{15} \div \frac{y - 2}{5}$

b.  $\frac{x + 5}{7} \div \frac{4x + 20}{9}$

d.  $\frac{x^2 - 4y^2}{x^2 + 3xy + 2y^2} \div \frac{x^2 - 4xy + 4y^2}{x + y}$

Example 3: Perform the indicated operation or operations.

a. 
$$\frac{5x^2 - x}{3x + 2} \div \left( \frac{6x^2 + x - 2}{10x^2 + 3x - 1} \cdot \frac{2x^2 - x - 1}{2x^2 - x} \right)$$

b. 
$$\frac{5xy - ay - 5xb + ab}{25x^2 - a^2} \div \frac{y^3 - b^3}{15x + 3a}$$