

## 6.2 Multiplying and Dividing Rational Exp.notebook

### 6.2 Multiplying and Dividing Rational Expressions

#### Multiplying Rational Expressions

↳ Multiplying rational expressions follows the same procedure as multiplying rational numbers, however you have to determine the non-permissible values for the variables.

Example 1: Multiply the rational numbers.

Simplify  $\frac{12}{40} \times \frac{16}{9}$

You can also  
**reduce first**  
before  
you multiply.

Example 2:  
Determine the product in simplest form.  
State the non-permissible values.

$$\frac{x^2 + 2x - 15}{x^2 - 8x + 7} \cdot \frac{x^2 - 5x - 14}{x^2 + 7x + 10}$$

When multiplying rational expressions, you should:

1. Simplify the expression
2. Find any restrictions
3. Cancel like factors
4. Multiply the rational expression

→  
Turn Over

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### Example 3:

Determine the product in simplest form.  
State the non-permissible values.

$$\frac{a^2 - a - 12}{a^2 - 9} \times \frac{a^2 - 4a + 3}{a^2 - 4a}$$

### Your Turn

Express each product in simplest form.  
What are the non-permissible values?

a)  $\frac{d}{2\pi r} \times \frac{2\pi rh}{d-2}$

b)  $\frac{y^2 - 9}{r^3 - r} \times \frac{r^2 - r}{y + 3}$

Turn Over

### Dividing Rational Expressions

↳ The rule for dividing rational expressions is the same as dividing rational numbers; **Multiply by the Reciprocal**

Example 1: Determine the quotient  $\frac{3}{4} \div \frac{1}{2}$

Example 2: Determine the quotient in simplest form. State the non-permissible values.  $\frac{x^2 + 5x + 4}{x^2 - 9} \div \frac{x^2 - 16}{x^2 + 5x + 6}$

Your Turn

(i) Determine the quotient in simplest form. State the non-permissible values.  $\frac{x^2 - 4}{x^2 - 4x} \div \frac{x^2 + x - 6}{x^2 + x - 20}$

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(ii) Simplify and state the non-permissible values.  $\frac{c^2 - 6c - 7}{c^2 - 49} \div \frac{c^2 + 8c + 7}{c^2 + 7c}$

Example 3: Simplify and state the non-permissible values?  $\frac{2m^2 - 7m - 15}{2m^2 - 10m} \div \frac{4m^2 - 9}{6} \times (3 - 2m)$

Example 4: Simplify and state the non-permissible values?  $\frac{3x + 12}{3x^2 - 5x - 12} \div \frac{12}{3x + 4} \times \frac{2x - 6}{x + 4}$

Key Ideas p. 326

Assign p. 327 - 330

1(ab),2(cd),3(bd),4(bc),8(bc),  
9,11,14, 15,16,18,19,20