

6.2 Multiplying and Dividing Rational Expressions

Multiply:

$$\text{a.) } \frac{5}{6} \times \frac{1}{7}$$

$$\text{b.) } \frac{12}{25} \times \frac{15}{16}$$

When multiplying rational expressions:

1. factor
2. identify restrictions
3. simplify
4. multiply numerators (denominators generally can be left as a factored form)

Example 1: Simplify

$$\text{a.) } \frac{6x}{5yz^2} \times \frac{3-y}{12x}$$

$$\text{b.) } \frac{x^2-3x-18}{x^2+9x} \times \frac{3x+27}{x^2+9x+1}$$

Try.) $\frac{2x^2-5x-3}{x^2-4} \times \frac{2-x}{2x^2+3x+1}$

Divide:

$$\frac{12}{25} \div \frac{3}{35}$$

When dividing rational expressions:

1. factor
2. identify restrictions
3. Multiply by the reciprocal by changing division to multiplication
4. identify new restrictions (restrictions are on both the numerators and denominators of expressions)
5. Simplify
6. multiply

Example 2: Simplify

a.) $\frac{5x^2z}{3y} \div \frac{x^3z^2}{4y^2}$

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

Try: $\frac{x^2+5x+6}{x^2+7x+6} \div \frac{x^2-x-6}{x^2-5x-6}$