Multiplication and Division of Rational Algebraic Expressions

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Sauyo High School

How to Multiply Rational Algebraic Expressions?

If m, n, p, and q are polynomials, such that $n \neq 0$ and $q \neq 0$, then

$$\frac{m}{n} \cdot \frac{p}{q} = \frac{mp}{nq}$$

How to Multiply Rational Algebraic Expressions?

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Example 1

Multiply $\dfrac{x^2-4}{2} \cdot \dfrac{4x}{x+2}$

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Example 2

Multiply $\dfrac{x+1}{3x^2-15x} \cdot \dfrac{8x-80}{x^2-9x-10}$

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Example 1

Divide $\dfrac{4x}{x-6} \div \dfrac{8x^2}{8x-48}$

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Example 2

Divide $\dfrac{x^2 - 2x - 15}{8x + 20} \div \dfrac{2x^2 - 10x}{4x + 10}$

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$$= \frac{x^2 - 2x - 15}{8x + 20} \cdot \frac{4x + 10}{2x^2 - 10x}$$

$$= \frac{(x - 5)(x + 3)}{4(2x + 5)} \cdot \frac{2(2x + 5)}{2x(x}$$

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How to Multiply Rational Algebraic Expressions?

1. Rewrite each numerator and denominator in prime factored form.
2. Divide by the common factors.

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How to Multiply Rational Algebraic Expressions?

1. Rewrite each numerator and denominator in prime factored form.
2. Divide by the common factors.
3. Multiply the remaining numerators and denominators.

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$$= \frac{x+3}{4x}$$

Thank you for watching.