Multiplying and Dividing Fractions

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Preliminaries

- Factor polynomials
- Reduce fractions

Objectives

- Multiply and divide fractions

$$\frac{(x^2 + 2x)}{(3x - 1)} \div \frac{(x^2 + 6x + 8)}{(3x^2 + 8x - 3)}$$

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Example 1

$$\frac{(x + 1)}{(x - 4)} \cdot \frac{5}{(x^2 - 1)} = \frac{(x + 1)}{(x - 4)} \cdot \frac{5}{(x + 1)(x - 1)} = \frac{5}{(x - 4)(x - 1)}$$

Dividing Fractions

$$\frac{(x^2 + 2x)}{(3x - 1)} \div \frac{(x^2 + 6x + 8)}{(3x^2 + 8x - 3)}$$

$$= \frac{(x^2 + 2x)}{(3x - 1)} \cdot \frac{(3x^2 + 8x - 3)}{(x^2 + 6x + 8)}$$

$$= \frac{x(x + 2)}{(3x - 1)} \cdot \frac{(3x - 1)(x + 3)}{(x + 2)(x + 4)} = \frac{x(x + 3)}{(x + 4)}$$

Recap

- Factor numerators and denominators
- Multiply numerators; multiply denominators in factored form
- Reduce fractions by cancelling common factors
- Division is multiplication by the reciprocal