

# Multiply & Divide Rational Expressions

1. Find the quotient and reduce to lowest terms:

$$\frac{x^2 - 5x + 6}{x + 4} \div \frac{x^2 - 9}{x^2 + 5x + 4}$$

2. Simplify the rational expression.

$$\frac{\left(\frac{x + 2}{x^2 - 2x - 3}\right)}{\left(\frac{x^2 - x - 6}{x^2 + 6x + 5}\right)}$$

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$$\begin{aligned} & \frac{x^2 - 5x + 6}{x + 4} \div \frac{x^2 - 9}{x^2 + 5x + 4} \\ &= \frac{x^2 - 5x + 6}{x + 4} \cdot \frac{x^2 + 5x + 4}{x^2 + 5x + 4} \\ &= \frac{(x - 3)(x - 2)}{x + 4} \cdot \frac{(x + 4)(x + 1)}{(x - 3)(x + 3)} \\ &= \frac{(x - 2)(x + 1)}{(x + 3)} \end{aligned}$$

2. Simplify the rational expression.

$$\frac{\left(\frac{x + 2}{x^2 - 2x - 3}\right)}{\left(\frac{x^2 - x - 6}{x^2 + 6x + 5}\right)}$$

$$\begin{aligned} & \frac{\frac{x + 2}{x^2 - 2x - 3}}{\frac{x^2 - x - 6}{x^2 + 6x + 5}} \\ &= \frac{x + 2}{x^2 - 2x - 3} \div \frac{x^2 - x - 6}{x^2 + 6x + 5} \\ &= \frac{x + 2}{x^2 - 2x - 3} \cdot \frac{x^2 + 6x + 5}{x^2 - x - 6} \\ &= \frac{(x - 3)(x + 1)}{x + 5} \cdot \frac{(x + 5)(x + 1)}{(x - 3)(x + 2)} \\ &= \frac{x + 5}{(x - 3)^2} \end{aligned}$$

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