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.

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

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

2. Simplify the rational expression.

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

$$\frac{\dfrac{x + 2}{x^2 - 2x - 3}}{\dfrac{x^2 - x - 6}{x^2 + 6x + 5}}$$
$$= \frac{x + 2}{x^2 - 2x - 3} \div \frac{x^2 - x - 6}{x^2 + 6x + 5}$$
$$= \frac{x + 2}{x^2 - 2x - 3} \cdot \frac{x^2 + 6x + 5}{x^2 - x - 6}$$
$$= \frac{x + 2}{(x - 3)(x + 1)} \cdot \frac{(x + 5)(x + 1)}{(x - 3)(x + 2)}$$
$$= \frac{x + 5}{(x - 3)^2}$$

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