Multiply & Divide Rational Expressions

1. Find the following product and reduce to lowest terms:

$$\left(\frac{2x + 6}{x^2 + x - 6}\right) \cdot \left(\frac{x^2 - 4}{2x}\right)$$

2. Find the following product and reduce to lowest terms:

$$\left(\frac{4n - 12}{3m + 6}\right)^{-2} \cdot \left(\frac{n^2 - 2n - 3}{m^2 + 4m + 4}\right)$$

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$$\left(\frac{2x+6}{x^2+x-6}\right)\cdot\left(\frac{x^2-4}{2x}\right)$$
$$=\left(\frac{2(x+3)}{(x+3)(x-2)}\right)\cdot\left(\frac{(x-2)(x+2)}{2x}\right)$$
$$=\frac{2(x+3)(x-2)(x+2)}{2x(x+3)(x-2)}$$
$$=\frac{x+2}{x}$$

2. Find the following product and reduce to lowest terms:

$$\left(\frac{4n-12}{3m+6}\right)^{-2}\cdot\left(\frac{n^2-2n-3}{m^2+4m+4}\right)$$

$$\left(\frac{4n-12}{3m+6}\right)^{-2}\cdot\left(\frac{n^2-2n-3}{m^2+4m+4}\right)$$
$$=\left(\frac{3m+6}{4n-12}\right)^{2}\cdot\left(\frac{n^2-2n-3}{m^2+4m+4}\right)$$
$$=\frac{3^2(m+2)^2(n-3)(n+1)}{4^2(n-3)^2(m+2)^2}$$
$$=\frac{9(n+1)}{16(n-3)}$$

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