Multiplying and Dividing Rational Expressions

Multiplying

$$\frac{2}{3} \cdot \frac{6}{5}$$

Step 1: Factor numerators and denominators completely.
Step 2: Cancel common factors vertically and diagonally.

1. Multiply.

a) $\dfrac{x+2}{x^2+x} \cdot \dfrac{x^2}{x^2+5x+6}$

b) $\dfrac{5x^4}{3y^2} \cdot \dfrac{6}{15x^2}$

c) $\dfrac{x^2 - 144}{x^2} \cdot \dfrac{x}{2x - 24}$

d) $\dfrac{x^2 - 2x - 15}{x^2 + 7x + 12} \cdot \dfrac{x^2 + 11x + 28}{x^2 + 2x - 35}$

<u>Dividing</u>

$$\frac{7}{4} \div \frac{21}{10}$$

Step 1: Change from division to multiplication and flip the second fraction.
Step 2: Factor numerators and denominators completely.
Step 3: Cancel common factors vertically and diagonally.

2. Divide.

a) $\dfrac{3}{x^2} \div \dfrac{18}{x^5}$

b) $\dfrac{3x-21}{1-x^2} \div \dfrac{x^2-49}{x^2-2x+1}$

c) $\dfrac{2x+1}{2x+12} \div \dfrac{x^2+3x-4}{3x+18}$