# Multiplying and Dividing Rational Expressions

For the fractions, is it easier to multiply first
then simplify **OR** to simplify first, then multiply?
Follow the steps you state are easier.

For the fractions, is it easier to divide first
then simplify **OR** to simplify first, then divide?
Follow the steps you state are easier.

a $\dfrac{3}{10} \times \dfrac{2}{9}$
   b $\dfrac{-4}{12} \times \dfrac{2}{6}$
   c $\dfrac{12}{75} \times \dfrac{18}{60}$

a $\dfrac{5}{3} \div \dfrac{1}{6}$
   b $\dfrac{4}{5} \div \dfrac{2}{10}$
   c $\dfrac{12}{75} \div \dfrac{18}{60}$

Perform the easier sequence of steps (from above) for each rational algebraic expression below.

a $\dfrac{x-5}{x+3} \times \dfrac{3x+9}{x+5}$

a $\dfrac{x+5}{x+6} \div \dfrac{5x+25}{x+3}$

c $\dfrac{x^2+3x-4}{2x^2-14x+24} \div \dfrac{4x^2-16x+12}{2x^2+4x-16}$

b $\dfrac{(x-2)(x-3)}{(x+2)(x+3)} \times \dfrac{(x+1)(x+2)}{(x-1)(x-2)}$

b $\dfrac{(x-8)(x-2)}{x(x+4)(x+3)} \div \dfrac{x(x+4)(x-2)}{(x+3)(x-5)}$

*Another?*

**Practice**

Simplify and state the restrictions on x.            Simplify each.  State the restrictions on x.

$$\frac{x^2 - 9}{x^2 - 8x + 16} \div \frac{x^2 + 6x + 9}{x^2 - 7x + 12}$$