

Rational Expressions -- Multiplying and adding with a common denominator

Multiplying fractions:

Remember: When you multiply fractions, we do not need the pieces to be the same size. In other words, we do not need a common denominator. Just multiply straight across.

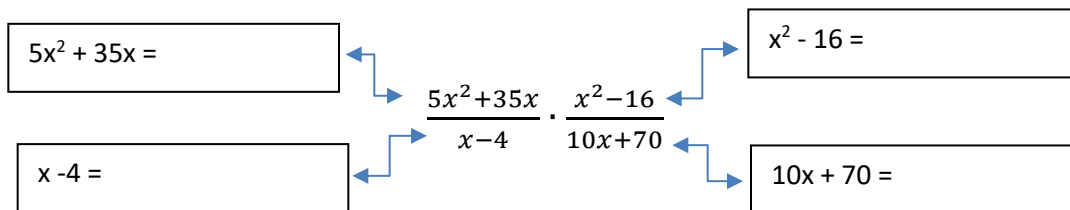
Example: $\frac{4}{9} \cdot \frac{2}{7} = \frac{4 \cdot 2}{9 \cdot 7} = \frac{8}{63}$

It is the same when we have variables.

Example: $\frac{5(x+7)}{(x-3)} \cdot \frac{(x-3)(x+3)}{5(x+7)} = \frac{5(x+7)(x-3)(x+3)}{(x-3) \cdot 5 \cdot (x+7)}$ Then simplify.

= _____

If the expression is not in factored form, **factor it first.**



Now, rewrite the expression in factored form, multiply and simplify:

_____ . _____

Multiply: $\frac{x^2+3x-10}{x-2} \cdot \frac{x+4}{6x+30}$

Adding and subtracting fractions with a common denominator:

Remember: When you add and subtract fractions, the pieces must be the same size. In other words, they must have a common denominator. Then we just add the numerators and the denominators stay the same.

Example: $\frac{3}{5} + \frac{7}{5} = \frac{3+7}{5} = \frac{10}{5} = 2$ Notice, we simplify as the last step.

In AA5-3 we will discuss how to find a common denominator in rational expressions.

We know that fractions cannot be added or subtracted unless they have the same denominator. Also, any reducing must take place AFTER adding, if possible.

Example: $\frac{3x^2+6x}{7x} + \frac{4x^2-10x}{7x} = \frac{3x^2+6x+4x^2-10x}{7x} = \frac{7x^2-4x}{7x}$ Then simplify.
= _____

Add: $\frac{x^2-5x}{3x-12} + \frac{5x-16}{3x-12}$

Note. When we subtract we have to remember to subtract the ENTIRE second fraction from the first. To do this we use parentheses when we combine the functions:

Example: $\frac{3x^2+6x}{2x+32} - \frac{2x^2-10x}{2x+32} = \frac{3x^2+6x-(2x^2-10x)}{2x+32} = \frac{3x^2+6x-2x^2+10x}{2x+32}$

Then combine like terms and simplify = _____

Subtract: $\frac{3x-4}{3x+3} - \frac{2x-5}{3x+3}$