Whenever you get stuck, think back to how you deal with normal fractions like $\frac{2}{4}+\frac{1}{5}$.

Intermediate algebra
Class notes
Adding and Subtracting Rational Expressions with Unlike Denominators (section 14.4)

**Recall fractions:**

We will need to find Least Common Denominators (LCDs).

Add $\frac{2}{4}+\frac{1}{5}$. Remember this involves finding the LCD of 4 and 5 and rewriting the fractions with that denominator. Once we have like denominators, we can add like normal.

So we want to change both denominators to 20. But how? And it's important that as we rewrite our fractions, we do not actually change their values, just their appearance.

$\frac{2}{4}+\frac{1}{5}$

We want both bottoms to be 20. What could we do to $\frac{2}{4}$ to get 20 on bottom without changing its value?

Notice $\frac{2}{4}\cdot\frac{5}{5}=\frac{10}{20}$

Why does multiplying by $\frac{5}{5}$ not change the value of our original fraction?

So, how would you add $\frac{2}{4}+\frac{1}{5}$? Do it now.

Let's move on to rational expressions, which remember are just fractions with algebra.

expl 1: Add.

$$\frac{7}{6x^2}+\frac{9}{8x^3}$$

Change the bottoms to the LCD without changing the values of our original fractions.

Review the previous section for more on finding the LCD.

expl 2: Add.

$$\frac{5}{12x^4}+\frac{7}{8x^2}$$

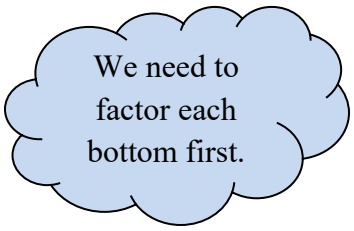
expl 3: Subtract.

$$\frac{3}{(x+2)(x+3)}-\frac{4x}{(x+2)(x-5)}$$

Subtraction requires extra care!

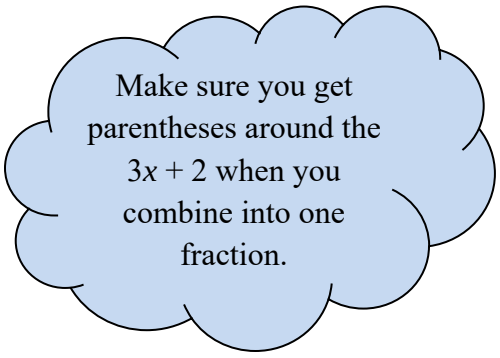
expl 4: Add.

$$\frac{-6}{x^2+4x-5}+\frac{5}{2x^2+x-3}$$



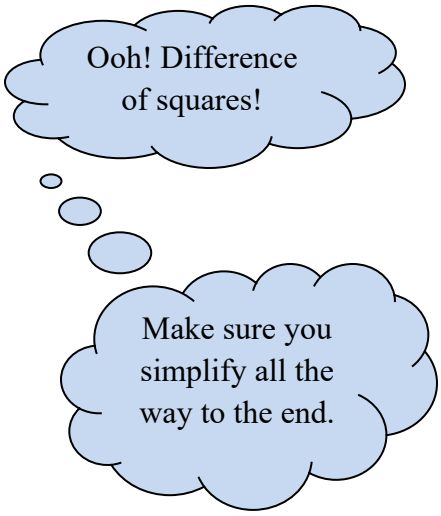

expl 5: Subtract.

$$\frac{4x}{(x+5)(x-1)}-\frac{3x+2}{(x+5)(x-2)}$$



expl 6: Add.

$$\frac{70}{x^2-100}+\frac{7}{2(x+10)}$$

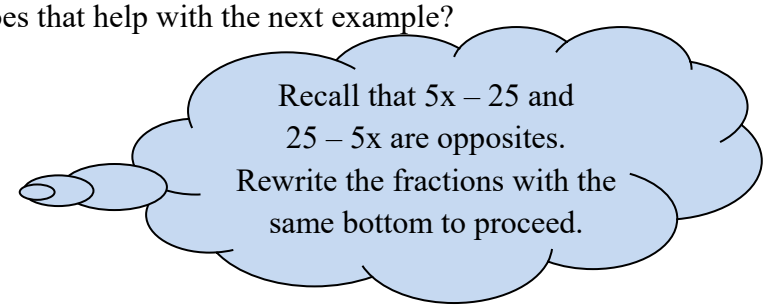



expl 7: Add.

$$\frac{-2x+15}{2x^2+5x-3}+\frac{3}{x+3}$$

**Opposite Denominators:**

What about $\frac{1}{4}+\frac{2}{-4}$? It looks like the denominators are different unless you write it as $\frac{1}{4}+\frac{-2}{4}$. Go ahead and add them now. How does that help with the next example?

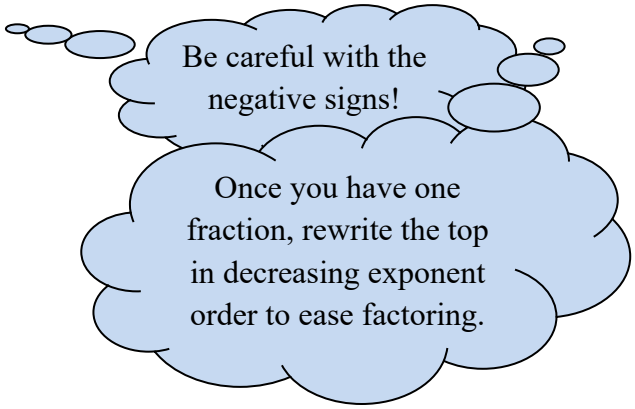



expl 8: Add or subtract.

$$\frac{10}{5x-25}+\frac{2x}{25-5x}$$

expl 9: Add or subtract.

$$\frac{-3}{x^2-3x}-\frac{2x^2-5x}{3x-x^2}$$




**Worksheet: Adding and Subtracting Rational Expressions:**

We practice various problems with unlike denominators involving those that are negatives of each other. One problem is a guided problem.