Any time you add or subtract with fractions you must have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Ex: add these polynomials:$\left(x^{2}+x+1\right)+\left(x^{2}+3\right)-(x+2)$

Combining like terms

Adding polynomials is a fancy way of saying \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ex: Add these rational expressions and simplify your answer:

1. $\frac{\left(x^{2}+x+1\right)}{3}+\frac{\left(x^{2}+3\right)}{3}-\frac{(x+2)}{3}$
2. $\frac{5x^{2}+2xy}{x^{2}+xy}+\frac{xy-2y^{2}}{x^{2}+xy}$

What do you do if the denominators are not common?

Ex: $\frac{1}{2} +\frac{1}{3}$

Ex: Add the rational expressions $\frac{x+1}{2} +\frac{x-1}{x}$

What is a LCD? What does it mean?

Find the least common denominator for this sum

$$\frac{1}{x}+\frac{x+2}{x+1}$$

## Finding the Least Common Multiple/Least Common Denominator:

Find the LCD/LCM for:

1. 15,12 b) 108,75 c) $x, (x-1)$ d) $x^{2}+2x+1,x^{2}-1$

How do we find the LCD/LCM?



Add or subtract the following:

1. 6.2.30 $\frac{8}{9y}-\frac{5}{18y^{2}}$



1. 6.2.40 $\frac{x}{x^{2}+11x+30}-\frac{4}{x^{2}+9x+20}$
2. 6.2.42 $\frac{8}{p}-\frac{7}{-p}$ 
3. ~6.2.38 $\frac{4xy}{x^{2}-y^{2}}-\frac{x+y}{x-y}$ $=\frac{4xy-x^{2}-2xy-y^{2}}{\left(x+y\right)\left(x-y\right)}=\frac{-(x^{2}-2xy+y^{2})}{\left(x+y\right)\left(x-y\right)}=\frac{-\left(x-y\right)^{2}}{\left(x+y\right)\left(x-y\right)}=\frac{-\left(x-y\right)^{}}{\left(x+y\right)}$
4. 6.2.64 $\frac{x-1}{x^{2}-1}-\frac{x}{x-2}+\frac{x^{2}+2}{x^{2}-x-2}$

Ex: Consider the function

$$f\left(x\right)=\frac{3x-2}{x^{2}+2x-24}-\frac{x-3}{x^{2}-9}$$

1. Find the simplified form and list all restrictions on the domain.
2. Find $f\left(0\right)\& f(a)$

$b) f\left(0\right)=\frac{18}{6∙3∙(-4)}=-\frac{1}{4}$

Things to remember:

* The LCM is the same as the LCD.
* How to find the LCM/LCD
* In order to add fractions you must have a common denominator.
* Magic One’s
* Reduce your answer
* Don’t multiply polynomial factors unless you have to.