Algebra 2 | Monday 4-1-13 | Class Notes

Ch. 5-3 Adding and Subtracting * Rational Expressions

* +, − fractions ⇒ common denominator

From 7-3 Pg 327 to 331

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

(Ex) $\frac{2x-1}{x^2+2} - \frac{4x+4}{x^2+2}$

Remember to state where the expression is NOT defined, i.e., what values of the variable make the denominator (bottom) Zero.

How to find the LCM (least common multiple) of Polynomials:

(Ex) (#2) Pg 328 LCM of $2x^3y^4$, $3x^5y^3$

Why? Because the LCM is the smallest polynomial both $2x^3y^4$ and $3x^5y^3$ will divide into evenly. Ie., it would be the LCD if you were adding or subtracting

$$\frac{1}{2x^3y^4} + \frac{1}{3x^5y^3}$$

LCM $\Rightarrow$ $2 \cdot x^3 \cdot y^4$ $\cdot$ $3 \cdot x^5 \cdot y^3$

use x^5 use y^4

Multiply all, for variables, use biggest

$\Rightarrow$ LCM $= 2 \cdot 3 \cdot x^5 \cdot y^4$

$= \boxed{6x^5y^4}$ both fit into this evenly

CONT * $\frac{1}{2x^3y^4} + \frac{1}{3x^5y^3}$ LCM $= 6x^5y^4$

$\frac{1}{2x^3y^4} \cdot \frac{3x^2}{3x^2} = \frac{3x^2}{6x^5y^4}$ LCM

$\frac{1}{3x^5y^3} \cdot \frac{2y}{2y} = \frac{2y}{6x^5y^4}$

$+$

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

(Ex) LCM ?

x^2+3x-4 , x^2-3x+2

Sum = 3
Prod = −4
−1, +4

sum = −3
prod = 2
−1, −2

$(x-1)(x+4)$, ~~$(x-1)$~~ $(x-2)$

$\therefore$ **LCM = $(x-1)(x+4)(x-2)$**

THIS WOULD BE THE LCD IF THE TRINOMIALS WERE IN THE bottom of a fraction And you wanted to + or −.

(Ex) $\dfrac{x-1}{x^2+3x+2} + \dfrac{x}{x+1}$

(Ex) $\dfrac{x}{x+3} + \dfrac{-18}{x^2-9}$

(Ex) $\dfrac{2x^2-16}{x^2-4} - \dfrac{x+4}{x+2}$

(Ex) $\dfrac{3x-4}{x+3} + \dfrac{2x+5}{x+3} = \dfrac{5x+1}{x+3}$

$x \neq -3$

(Ex) pg 327 to 331 $\dfrac{2x-1}{x^2+2} - \dfrac{(4x+4)}{x^2+2} = \dfrac{-2x-5}{x^2+2}$

$x = \mathbb{R}$

(Ex) $\dfrac{x-1}{x^2+3x+2} + \dfrac{x}{x+1}$

x^2+3x+2

sum = 3

prod = 2

$+1 \quad +2$

$\dfrac{x-1}{(x+1)(x+2)} + \dfrac{x}{(x+1)} \cdot \dfrac{(x+2)}{(x+2)}$

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

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

$$\boxed{\dfrac{x^2+3x-1}{(x+1)(x+2)}}$$

or

$$\boxed{\dfrac{x^2+3x-1}{x^2+3x+2}}$$

(Ex) $\dfrac{x}{x+3} + \dfrac{-18}{x^2-9}$

$\dfrac{x-3}{x-3} \cdot \dfrac{x}{(x+3)} + \dfrac{-18}{(x+3)(x-3)}$

$\dfrac{x^2-3x}{(x+3)(x-3)} + \dfrac{-18}{(x+3)(x-3)}$

$\dfrac{x^2-3x-18}{(x+3)(x-3)}$

SUM $= -3$
PROD $= -18$
$+3 \quad -6$

$\dfrac{(x+3)(x-6)}{(x+3)(x-3)} = \boxed{\dfrac{x-6}{x-3}}$

$\boxed{x \neq \pm 3}$

(Ex) $\dfrac{2x^2-16}{x^2-4} - \dfrac{x+4}{x+2}$

$\dfrac{2(x^2-8)}{(x-2)(x+2)} - \dfrac{x+4}{x+2} \cdot \dfrac{x-2}{x-2}$

$\dfrac{2(x^2-8)}{(x-2)(x+2)} - \dfrac{(x+4)(x-2)}{(x-2)(x+2)}$

$\dfrac{2x^2-16-(x^2+2x-8)}{(x-2)(x+2)}$

$\dfrac{2x^2-16-x^2-2x+8}{(x-2)(x+2)}$

$\dfrac{x^2-2x-8}{(x-2)(x+2)} = \dfrac{(x+2)(x-4)}{(x-2)(x+2)}$

Sum $\Rightarrow -2$
prod $\Rightarrow -8$
$+2 \quad -4$

$\dfrac{x-4}{x-2}$ $\quad x \neq \pm 2$