Unit 3: Multiplying and Dividing Algebraic Fractions continued...

Ex 1
3.2

BEDMAS

$$\frac{x^2-8x-9}{x^2-17x+72} \times \frac{x^2-25}{x^2-1} \div \frac{x^2+4x-5}{x^2-9x+8}$$

-9

$-9, 1$

72

$-9, -8$

$$\frac{(x+1)(x-9)}{(x-9)(x-8)} \times \frac{(x-5)(x+5)}{(x-1)(x+1)} \times \frac{(x-8)(x-1)}{x^2+4x-5}$$

$$\frac{(x+1)}{(x-8)} \times \frac{(x-5)(x+5)}{(x-1)(x+1)} \times \frac{(x-8)}{(x+5)}$$

$$\frac{(x+1)(x-5)(x+5)(x-8)}{(x-8)(x-1)(x+1)(x+5)}$$

$$\frac{x-5}{x-1}$$

$$\frac{b^2-b-20}{b^2-25} \div \frac{b^2+2b-8}{b^2-b-2} \div \frac{b+1}{b^2+5b}$$

$$\frac{(b-5)(b+4)}{(b-5)(b+5)} \times \frac{(b-2)(b+1)}{(b+4)(b-2)} \times \frac{b(b+5)}{(b+1)}$$

$$\frac{(b+4)(b+1)(b+5)b}{(b+5)(b+4)(b+1)}$$

$$b$$

Unit 4 : Adding and Subtracting Algebraic Fractions

Recall :

How to add (subtract) numeric fractions.

Step (1)

To add, the denominators have to be the same.

$$\frac{1}{3} + \frac{2}{3} \quad \begin{matrix} \times 2 \\ \times 2 \end{matrix}$$

$$\frac{3 \times 1}{3 \times 2} + \frac{2}{3 \times 2}$$

LCD = 2 · 3

LCD = least common denominator

$$\frac{3}{6} + \frac{4}{6}$$

Step (2)

Keep denominator and add or subtract the numerators!

$$\frac{3+4}{6} = \frac{7}{6}$$

$\frac{4}{6}$ 0.6666

$\frac{2}{3} = 0.6666$

$\frac{2}{6} = 0.333$

$$\frac{1}{2} + \frac{3}{4}$$

~~Error~~

LCD : 4

LCD : $2 \cdot 2$

$$\frac{2 \times 1}{2 \times 2} + \frac{3}{2 \cdot 2}$$

$$\frac{2}{4} + \frac{3}{4}$$

$$\frac{2+3}{4} = \frac{5}{4}$$

$$\frac{(a+2)}{a^2+3a+2} + \frac{1}{a^2+4a+3}$$

2 : 2, 1

3 : 3, 1

$$\frac{(a+2)}{(a+2)(a+1)} + \frac{1}{(a+3)(a+1)}$$

To get the lowest common denominator, figure what 'cracked' is missing.

$(a+3)$

$$\frac{1}{(a+3)\times(a+1)} + \frac{1}{(a+3)(a+1)}$$

$$\frac{(a+3)}{(a+3)(a+1)} + \frac{1}{(a+3)(a+1)}$$

$$\frac{(a+3)+1}{(a+3)(a+1)} = \frac{a+3+1}{(a+3)(a+1)} = \frac{a+4}{(a+3)(a+1)}$$

$$\frac{1}{m^2+4m+3} - \frac{1}{m^2+2m+1}$$

$3:3_1 1$

$$\frac{(m+1)\ 1}{(m+1)(m+1)(m+3)} - \frac{1\ (m+3)}{(m+1)(m+1)(m+3)}$$

$$\frac{(m+1)-(m+3)}{(m+1)(m+1)(m+3)}$$

$$\frac{\cancel{m}+1-\cancel{m}-3}{(m+1)(m+1)(m+3)} = \frac{-2}{(m+1)(m+1)(m+3)}$$

Factor out a negative one

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

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

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

$$\frac{2}{2-3b+b^2} + \frac{3}{2+b-b^2} - \frac{4}{4-4b^2}$$

① $2-3b+b^2$

$(b-2)(b-1)$

2: $-2, -1$

② $2+b-b^2$

$-b^2+b+2$

$-1(b^2-b-2)$

$-1(b-2)(b+1)$

$-2 \cdot 2, -$

-1×2

$-b^2+2b-b+2$

$-b(b-2)-1(b-2)$

$(b-2)(-b-1)$

$(-b+2)(b+1)$

③ $4-4b^2$

$\sqrt{4}=2$

$(2+2b)(2-2b)$

$\sqrt{4b^2}=2b$

$2(1+b)2(1-b)$

$4(1-b^2)$

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

$$\frac{2}{(b-2)(b-1)} + \frac{3}{-1(-b+2)(b+1)} - \frac{1}{(1+b)(1-b)\,-1}$$

$$\frac{2}{(b-2)(b-1)} + \frac{3}{-1(b-2)(b+1)} - \frac{1}{(1+b)(b-1)\,-1}$$

$$\frac{(b+1)\,2}{(b+1)(b-2)(b-1)} + \frac{-3(b-1)}{(b-2)(b+1)(b-1)} - \frac{-1(b-2)}{(1+b)(b-1)(b-2)}$$

$$\frac{2(b+1)+-3(b-1)\;-\;-1(b-2)}{(b+1)(b-2)(b-1)}$$

$$\frac{2(b+1)-3(b-1)+1(b-2)}{(b+1)(b-2)(b-1)}$$

$$\frac{2b+2-3b+3+b-2}{(b+1)(b-2)(b-1)}$$

$$\frac{3}{(b+1)(b-2)(b-1)}$$

$$\frac{-3a}{-a^3+2a^2+8a} + \frac{2a}{a^3-4a}$$