Adding & Subtracting Rationals

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

* Add across the top (numerator) keep denominator the same, then simplify.

$$3 \cdot \left(\frac{1}{2}\right) + \left(\frac{2}{3}\right)^2 = \frac{3}{6} + \frac{4}{6} = \frac{7}{6}$$

* Make common denominators. (Multiply the top & bottom)

Same Thing With Rationals!

Adding With Common Denominators.

Exs) $\frac{4x-3}{x^2+3x-2} + \frac{6x-5}{x^2+3x-2} = \frac{10x-8}{x^2+3x-2}$

* Denominator DNF, can't simplify.

$$\frac{8x+5}{6x-3} + \frac{7x-5}{6x-3} = \frac{15x}{6x-3} = \frac{15x}{3(2x-1)} \overset{\div 3}{}$$

$$\frac{5x}{(2x-1)} \quad x \neq 1/2$$

$2x - 1 = 0$
$2x = 1$
$x = 1/2$

"Opposite of the back, divided by the front."

$$\frac{3x+1}{x^2+x-6} + \frac{-2x+2}{x^2+x-6} = \frac{x+3}{x^2+x-6}$$

$$\frac{x+3}{(x+3)(x-2)} = \frac{1}{x-2} \qquad x \neq 2, -3$$

Subtracting:

- $\frac{x}{x+2} - \frac{5}{x+2} = \frac{x-5}{(x+2)} \qquad x \neq -2$

- $\frac{5x-6}{x+2} - \frac{x-2}{x+2} = \frac{4x-4}{x+2} = \frac{4(x-1)}{x+2}$

  * can't simplify further. $x \neq -2$

Ex) $\frac{6x-4}{3x+5} - \frac{2x-3}{3x+5} = \frac{4x-1}{3x+5} \qquad x \neq \frac{-5}{3}$

- $\frac{7x+2}{x+7} - \frac{4x^2+5x-4}{x+7} = \frac{-4x^2+2x+6}{x+7}$

Practice!

① $\frac{u-v}{8v} + \frac{6u-3v}{8v} = \frac{7u-4v}{8v}$ $v \neq 0$

$\frac{8v}{8} = \frac{0}{8}$ $v \neq 0$

② $\frac{m-3n}{6m^3n} - \frac{m+3n}{6m^3n} = \frac{-6n}{6m^3n} = \frac{-n}{m^3n}$

③ $\frac{5}{a^2+3a+2} + \frac{5a+1}{a^2+3a+2} = \frac{5a+6}{a^2+3a+2}$

$\frac{5a+6}{(a+2)(a+1)}$ $x \neq -1, -2$

3	2
2+1	2·1

④ $\frac{5}{10n^2+16n+6} + \frac{n-6}{10n^2+16n+6} = \frac{n-1}{10n^2+16n+6}$

$\frac{n-1}{(5n+3)(n+1)}$ $x \neq \frac{3}{5}, -1$