

Add + Subtract Rationals

ex. 1

$$\frac{3x-4}{x+3} + \frac{2x+5}{x+3} = \frac{5x+1}{x+3} \quad x \neq -3$$

Like Denominators

ex. 2

$$\frac{2x-1}{x^2-2} - \frac{4x+4}{x^2-2} = \frac{2x-1-4x-4}{x^2-2} = \frac{-2x-5}{x^2-2}$$

Least Common Multiple

ex. 3

$$2x^2y^4 + 3x^5y^3$$

* Smallest #, they both go into
* w/ variables → pick the larger exponent

$$\text{LCM: } 6x^5y^4$$

ex. 4

$$x^2+3x-4 + x^2-3x+2$$

* Factor both

* Write each factor once *special case*

$$\text{LCM: } (x+4)(x-1) + (x-1)(x-2)$$

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

$$* x^2 + 4x + 4 + x^2 - 4$$

$$(x+2)(x+2) \quad (x+2)(x-2)$$

$$\text{LCM: } (x+2)(x+2)(x-2)$$

$$(3x+1) + (x+4)$$

LCM:

$$(3x+1)(x+4)$$

ex. 5 $\frac{x-1}{x^2+3x+2} + \frac{x(x+2)}{(x+1)(x+2)}$ LCM: $(x+2)(x+1)$

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

ex. 6 $\frac{2x^2-16}{x^2-4} - \frac{(x+4)(x-2)}{(x+2)(x-2)}$ LCM: $(x+2)(x-2)$

* Only Factor Denominator!!

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

Factor $\frac{x^2-2x-8}{(x-2)(x+2)} = \frac{(x-4)(x+2)}{(x-2)(x+2)} = \frac{x-4}{x-2}$ $x \neq 2, -2$

ex. 7

Complex Fractions

$\frac{2}{x+2}$ Add First: $\frac{1(x)}{x+2} + \frac{2(x+2)}{x} = \frac{x}{x(x+2)} + \frac{2x+4}{x(x+2)}$

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

Rewrite: $\frac{2}{\frac{3x+4}{x(x+2)}} \xrightarrow{\text{Divide} \rightarrow \text{KCF}} \frac{2}{x+2} \cdot \frac{x(x+2)}{3x+4} = \frac{2x}{3x+4}$