

Adding & Subtracting Rational Expressions:

- Steps:
- ① Factor the bottom & look for LCD.
 - ② Multiply the top by what it's missing from the LCD.
 - ③ Rewrite the fractions w/ same denominator.
 - ④ Add or Subtract numerators. Combine like terms!
 - ⑤ Rewrite answer. Pretty!

Examples: ① $\frac{7x}{12y^2} + \frac{4y}{6x^2}$

LCD: $12x^2y^2$

$$\frac{x^2}{x^2} \cdot \frac{7x}{12y^2} + \frac{4y}{6x^2} \cdot \frac{2y^2}{2y^2}$$

$$\boxed{\frac{7x^3 + 8y^3}{12x^2y^2}} \quad \begin{matrix} x \neq 0 & y \neq 0 \end{matrix}$$

② $\frac{3y+1}{2y-10} + \frac{1}{y^2-2y-15}$

LCD: $2(y-5)(y+3)$

$$\frac{(y+3)(3y+1)}{(y+3)2(y-5)} + \frac{1}{(y-5)(y+3)} \cdot \frac{2}{2}$$

$$\frac{(y+3)(3y+1) + 1(2)}{2(y-5)(y+3)}$$

$$= \frac{3y^2 + 10y + 3 + 2}{2(y-5)(y+3)} \quad \left. \begin{matrix} y \neq 5, -3 \end{matrix} \right\} \frac{3y^2 + 10y + 5}{2(y-5)(y+3)}$$

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

LCD: $(x-3)(x+2)(x+2)$

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

$$\frac{(x+2)5x - 4(x-3)}{(x+2)(x-3)(x+2)} = \frac{5x^2 + 10x - 4x + 12}{(x+2)(x-3)(x+2)}$$

$$\boxed{\frac{5x^2 + 6x + 12}{(x+2)(x-3)(x+2)}} \quad x \neq -2, 3$$