

8.5 ADDING AND SUBTRACTING RATIONAL EXPRESSIONS

RECALL: $\frac{2}{3} + \frac{3}{4} = \frac{8}{12} + \frac{9}{12} = \frac{17}{12}$

TO ADD: MUST HAVE A COMMON DENOMINATOR

EX: $\frac{1}{3x^2+21x+30} + \frac{4x}{3x+15}$

$$\frac{1}{3(x^2+7x+10)} + \frac{4x}{3(x+5)}$$

$$\frac{1}{3(x+5)(x+2)} + \frac{4x}{3(x+5)}$$

$$\frac{1}{3(x+5)(x+2)} + \frac{4x(x+2)}{3(x+5)(x+2)}$$

$$\frac{1}{3(x+5)(x+2)} + \frac{4x^2+8x}{3(x+5)(x+2)}$$

$$\frac{4x^2+8x+1}{3(x+5)(x+2)}$$

$$\text{Ex: } \frac{x}{3x^2 - 5x + 6} - \frac{2x + 1}{3x^2 + 3x - 6}$$

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

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

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

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

$$= \frac{-x^2 + 5x + 2}{3(x-1)(x-2)(x+2)}$$

$$\text{Ex: Simplify } \frac{\frac{1}{xy} - \frac{1}{y^2}}{\frac{1}{x^2y} - \frac{1}{xy^2}}$$

MULTIPLY BY
THE LCD

$$\frac{\frac{1}{xy} - \frac{1}{y^2}}{\frac{1}{x^2y} - \frac{1}{xy^2}} = \frac{xy - x^2}{y - x} = \frac{x(y-x)}{(y-x)} = x$$