

Sec 9-4: Adding/Subtracting Rational Expressions

Bottom Line: to add/subtract fractions, must have common denominator.
* then add numerators *

ex.) $\frac{5}{8} + \frac{1}{6}$

24 is the LCD.

$$\frac{5}{8} \cdot \frac{3}{3} + \frac{1}{6} \cdot \frac{4}{4}$$

$$\frac{15}{24} + \frac{4}{24} = \boxed{\frac{19}{24}}$$

ex. 2

$$\frac{2x}{5ab^3} + \frac{4y}{3a^2b^2}$$

$$\boxed{\text{LCD is } 15a^2b^3}$$

$$\frac{2x(3a)}{5ab^3(3a)} + \frac{4y(5b)}{3a^2b^2(5b)}$$

$$\frac{6ax}{15a^2b^3} + \frac{2oby}{15a^2b^3} = \frac{6ax + 2oby}{15a^2b^3}$$

ex.) $\frac{3a}{7x^6y^2} - \frac{a}{14x^9y^5}$

LCD
 $14x^9y^5$

$$\frac{3a}{7x^6y^2} \cdot \frac{2x^3y^3}{2x^3y^3} - \frac{a}{14x^9y^5}$$

$$\frac{6axy^3}{14x^9y^5} - \frac{a}{14x^9y^5}$$

$$\frac{6axy^3 - a}{14x^9y^5}$$

Sec 9-4 continued

ex 4

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

↓

Factor

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

LCD is $(x+2)(x+2)(x+3)$

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

Distribute $x^2 + 2x - 2x - 6$

$$\frac{x^2 - 6}{(x+2)(x+2)(x+3)}$$

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

Ex 5

$$\frac{x-5}{2x-6} - \frac{x-7}{4x-12}$$

Always, factor first.

$$\frac{x-5}{2(x-3)} - \frac{x-7}{4(x-3)}$$

$$\text{LCD: } 4(x-3)$$

$$\frac{(x-5)2}{4(x-3)} - \frac{x-7}{4(x-3)}$$

$$\frac{2x-10-x+7}{4(x-3)} = \frac{1(x-3)}{4(x-3)}$$

$$= \boxed{\frac{1}{4}}$$

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$$\textcircled{20} \quad \frac{3m+2}{m+n} + \frac{4}{2m+2n}$$

$$\text{Factor} \quad \frac{3m+2}{m+n} + \frac{4}{2(m+n)}$$

$$\frac{(3m+2)2}{2(m+n)} + \frac{4}{2(m+n)}$$

$$\frac{6m+4 + 4}{2(m+n)} = \frac{6m+8}{2(m+n)}$$

$$= \frac{3m+4}{m+n}$$

21.

$$\frac{5}{1} + \frac{x-3}{x+2}$$

LCD is
x+2

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

$$\frac{5x+10+x-3}{x+2} = \frac{6x+7}{x+2}$$