Chapter 8.5: Add and Subtract Rational Expressions

How do you add fractions?

*need a common denominater*  LCM

How do you subtract fractions?

*Same as add.*

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

$$\frac{5}{15} - \frac{6}{15} = \boxed{\frac{-1}{15}}$$

$$\frac{7}{4x} + \frac{3}{4x}$$

$$\frac{10}{4x}$$

$$\boxed{\frac{5}{2x}}$$

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

$$\boxed{\frac{2x-5}{x+6}}$$

# Find the LCM

$$4x^2-16 \qquad 6x^2-24x+24$$

$$4(x^2-4) \qquad 6(x^2-4x+4)$$

$$4(x+2)(x-2) \qquad 6(x-2)(x-2)$$

$$2(2)(x-2)(x+2) \qquad 2(3)(x-2)(x-2)$$

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

$$\frac{7(x+1)}{9x^2}+\frac{x \quad 3x}{3x^2+3x}$$

$$3(3)x^2(x+1) \quad 3x(x+1) \quad 3x$$

$$\frac{7(x+1)+3x \cdot x}{(3)(3)x^2(x+1)} = \frac{3x^2+7x+7}{9x^2(x+1)}$$

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

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

$$\frac{(x+2)(x-3) - \left[-1(2x+1)(2)\right]}{2(x-1)(x-3)}$$

$$\frac{x^2-x-6 + (+4x+2)}{2(x-1)(x-3)}$$

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

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

# Complex Fractions:

## Fractions within fractions

simplified by working with the innermost
fractions first and working your way out.
GOAL is to have one fraction.

$$\frac{\frac{1}{2}}{\frac{5}{15}\frac{1}{3} - \frac{2}{5}\frac{6}{15}} \qquad \boxed{\frac{\frac{1}{2}}{\frac{-1}{15}}} \qquad \boxed{\frac{15}{-2}}$$

Let f be the focal length of a thin camera lens, p be the distance between an object being photographed and the lens, and q be the distance between the lens and the film. For the photograph to be in focus, the variables should satisfy the lens equation below. Simplify the fraction

$$f = \dfrac{1}{\dfrac{1}{p} + \dfrac{1}{q}}$$

$$\dfrac{\dfrac{5}{x+4}}{\dfrac{1x}{x(x+4)} + \dfrac{2(x+4)}{x(x+4)}} = \dfrac{\dfrac{5}{x+4}}{\dfrac{x+2x+8}{x(x+4)}} = \boxed{\dfrac{\dfrac{5}{x+4}}{\dfrac{3x+8}{x(x+4)}}}$$

$$\dfrac{5x(x+4)}{(x+4)(3x+8)} = \boxed{\dfrac{5x}{3x+8}}$$

Homework: Chapter 8.5 pg. 586
#'s 4,14,18,20,22,24,26,30,32,36