

March 6

Add/Subtract Rational Expressions With Different Denominators

(Ex) Simplify: $\frac{5}{v+3} + \frac{5}{v^2-9}$

$$v^2-9 \\ \sqrt{v^2}=v \quad \sqrt{9}=3 \\ (v+3)(v-3)$$

step 1: Factor denominator (bottom) ONLY!

$$\frac{5}{(v+3)} + \frac{5}{(v+3)(v-3)}$$

step 2: Find LCD:

$$\text{LCD: } (v+3)(v-3)$$

step 3: Make fractions have LCD.

$$\frac{5(v-3)}{(v+3)(v-3)} \Rightarrow \frac{5v-15}{(v+3)(v-3)}$$

step 4: Put back in "fixed" fractions. Finish problem.

$$\frac{(5v-15)}{(v+3)(v-3)} + \frac{5}{(v+3)(v-3)}$$

$$\frac{(5v-15)+5}{(v+3)(v-3)}$$

$$\frac{5v-15+5}{(v+3)(v-3)}$$

$$\frac{5v-10}{(v+3)(v-3)}$$

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

$$\frac{5v-10}{5 \quad 5} \quad \text{GCF: } 5 \\ \frac{5(v-2)}{5 \quad 5}$$

Ex2 Simplify: $\frac{2}{(x+3)} - \frac{5}{(x+4)}$

LCD: $(x+3)(x+4)$

$$\frac{2(x+4)}{(x+3)(x+4)} \Rightarrow \frac{2x+8}{(x+3)(x+4)}$$

$$\frac{5(x+3)}{(x+4)(x+3)} \Rightarrow \frac{5x+15}{(x+3)(x+4)}$$

$$\frac{(2x+8)}{(x+3)(x+4)} - \frac{(5x+15)}{(x+3)(x+4)}$$

$$\frac{(2x+8) - (5x+15)}{(x+3)(x+4)}$$

$$\frac{2x+8-5x-15}{(x+3)(x+4)}$$

$$\boxed{\frac{-3x-7}{(x+3)(x+4)}}$$