

Class # 34 - Thurs, Nov 18

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- reminder about Exen #2
    - pdf on Opened-Fibs + a Blackboard.
    - outlined Exen exercises + pic  
a Tuesday (end of class)
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More "rational expressions"

- reducing (cancelling common factors)
- adding/subtracting
- simplifying "complex fractions"

# More examples for "Add Rational Expressions 2"

(2)

Steps: (1) identify the "LCD" (by factoring the denominators  
(2) "scale up" each term so it has the LCD and identify the "LCM")

#2.2

$$\frac{6a+21}{5a+30} - \frac{a+3}{a+6}$$

\*LCM of  $5(a+6)$ ,  $(a+6)$   
is  $\underbrace{5(a+6)}_{\text{LCD}}$

$$= \frac{6a+21}{5(a+6)} - \left[ \frac{(a+3)}{(a+6)} \cdot \frac{5}{5} \right]$$

common denominator!

$$= \frac{(6a+21) - (5a+15)}{5(a+6)} = \frac{a+6}{5(a+6)} = \frac{1}{5}$$

2.3

$$\frac{5a+17}{4(a-3)} - \frac{(a+5) \cdot \frac{4}{4}}{(a-3) \cdot \frac{4}{4}} = \frac{(5a+17) - (4a+20)}{4(a-3)} \textcircled{3}$$

$$= \frac{a-3}{4(a-3)} = \frac{1}{4}$$

#3

$$\frac{y+6}{y-2} - \frac{y-6}{2-y}$$

denominators are  
"opposites"

\* we can just use  $(y-2)$  as LCD!

$$\begin{aligned} (y-2) &= -1 \cdot (2-y) \\ (2-y) &= -1 \cdot (y-2) \end{aligned}$$

(i.e., they are of opposite sign - they differ by a factor of  $-1$ )

$$= \frac{(y+6)}{(y-2)} - \frac{(y-6)}{(2-y)} \cdot \frac{(-1)}{(-1)}$$

$$= \frac{(y+6)}{(y-2)} + \frac{(y-6)}{(y-2)} = \frac{2y}{y-2}$$

Add Rat/Exp 2 #4

4

$$\frac{(w+8)(w+9)}{(w-9)(w+9)} + \frac{(-21w-117)}{(w+9)(w-9)} = \dots$$

$$= \frac{(w^2 + 17w + 72) - 21w - 117}{(w-9)(w+9)}$$

$$= \frac{w^2 - 4w - 45}{(w-9)(w+9)} = \frac{(w+5)(\cancel{w-9})}{(\cancel{w-9})(w+9)}$$

Complex Fractions (involving rational expressions - not anything to do w/ complex #s!)

§ 7.3 of Open Stax

numerical "complex fraction"

$$\frac{(3/5)}{(9/10)} = \frac{2}{8} \cdot \frac{10^2}{93} = \boxed{\frac{2}{3}}$$

"Complex Fractions - Method 1"

#1

$$\frac{\left(\frac{8x^6}{3y^5}\right)}{\left(\frac{5x^3}{7xy^5}\right)} = \frac{8x^6}{3y^5} \cdot \frac{7xy^5}{5x^3} = \frac{56x^7}{15x^3} = \boxed{\frac{56x^4}{15}}$$

#3

$$\frac{\left(\frac{x+9}{3x^2}\right)}{\left(\frac{4x+36}{9}\right)} = \frac{\cancel{(x+9)}}{\cancel{3}x^2} \cdot \frac{9\cancel{3}}{4\cancel{(x+9)}}$$
$$= \boxed{\frac{3}{4x^2}}$$

#6

$$\frac{15 - \frac{4}{5x}}{\frac{4}{15x} - 5} = \frac{15\left(\frac{5x}{5x}\right) - \frac{4}{5x}}{\frac{4}{15x} - 5\left(\frac{15x}{15x}\right)}$$

} common denom. of  $5x$

} LCD of  $15x$

$$= \frac{\frac{75x}{5x} - \frac{4}{5x}}{\frac{4}{15x} - \frac{75x}{15x}} = \frac{\frac{75x-4}{5x}}{\frac{4-75x}{15x}}$$
$$= \frac{\frac{75x-4}{5x} \cdot \frac{-15x}{(4-75x)}}{\frac{3\cancel{15} \cdot (75x-4)}{5 \cdot (4-75x)}} = \boxed{-3}$$