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# Class #35 - Fri Nov 19

- Exam #2 (due today! 6pm).
- more "complex fractions"
- start: solving "rational equations"

→ started yesterday

## WebWork :

- due Tuesday : "Nonlinear Systems"  
"Reducing Rational Exp"  
"Add Rational Exps" + "Add Rational Exp 2"
- open (but due after Thanksgiving) :

examples  
yesterday!

→ "Complex Fractions Method 1" ~~→ "Complex"~~

# Complex Fractions - Method 1 : #5

Step 1 : simplify  $\left(\frac{4}{5} + \frac{17}{20}\right)$   $\rightarrow$  LCD = 20 <sup>②</sup>  
 and  $\left(\frac{7}{8} - \frac{1}{2}\right)$  [separately - using LCDs]  
 LCD = 8

Simplify :  $\frac{\left(\frac{4}{5} + \frac{17}{20}\right)}{\left(\frac{7}{8} - \frac{1}{2}\right)}$

$$= \frac{\left(\frac{4}{5} \cdot \frac{4}{4} + \frac{17}{20}\right)}{\left(\frac{7}{8} - \frac{1}{2} \cdot \frac{4}{4}\right)} = \frac{\left(\frac{16}{20} + \frac{17}{20}\right)}{\left(\frac{7}{8} - \frac{4}{8}\right)} = \frac{\left(\frac{33}{20}\right)}{\left(\frac{3}{8}\right)}$$

$$= \frac{33}{20} \cdot \frac{8^4}{8} = \frac{44}{10} = \boxed{\frac{22}{5}}$$

# Complex Fractions - Method 1 : #6

3

Simplify :

$$\frac{\frac{63}{1} \cdot \frac{7x}{7x} - \frac{8}{7x}}{\frac{8}{63x} - \frac{7}{1} \cdot \frac{63x}{63x}} = \frac{\frac{441x}{7x} - \frac{8}{7x}}{\frac{8}{63x} - \frac{441x}{63x}}$$

$$= \frac{\left( \frac{441x - 8}{7x} \right)}{\left( \frac{8 - 441x}{63x} \right)} = \frac{(441x - 8)}{7x} \cdot \frac{9}{\cancel{63x} (8 - 441x)}$$

$$= 9 \cdot \frac{(\cancel{441x - 8})^{-1}}{(\cancel{8 - 441x})} \leftarrow \text{"opposites" (equal but opposite sign)}$$

$$= \boxed{-9}$$

## Complex Fractions - Method 2

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$$\frac{\left(\frac{8y}{y-4}\right)}{\left(\frac{7}{11y-44}\right)} = \frac{(8y)}{(\cancel{y-4})} \cdot \frac{11(\cancel{y-4})}{(11y-44)} = \frac{88y}{7}$$

Next topic : Solving "rational equations"

Ex : Solve for  $x$  :  $\frac{1}{6}x + \frac{1}{2} = \frac{1}{3}$

$$\cancel{x} \left( \frac{1}{\cancel{x}} x \right) = \left( \frac{1}{3} - \frac{1}{2} \right) \cdot \cancel{6} \frac{6}{1}$$

$$x = 6 \left( \frac{1}{3} - \frac{1}{2} \right) = \frac{6}{3} - \frac{6}{2} \\ = 2 - 3 = \boxed{-1}$$

Check : (Substitute  $x = -1$  into the original eqn)

~~$\frac{1}{6}x + \frac{1}{2} = \frac{1}{3}$~~ 

$$\frac{1}{6}(-1) + \frac{1}{2} \stackrel{?}{=} \frac{1}{3}$$

$$-\frac{1}{6} + \frac{1}{2} \stackrel{?}{=} \frac{1}{3}$$

$$-\frac{1}{6} + \frac{3}{6} \stackrel{?}{=} \frac{1}{3} \Rightarrow \frac{2}{6} = \frac{1}{3} \checkmark$$

OpenStax: Example 7.33:

⑥

Solve for  $x$ :  $\frac{1}{x} + \frac{1}{3} = \frac{5}{6}$

$$\frac{1}{x} = \frac{5}{6} - \frac{1}{3}$$

$$\frac{1}{x} = \frac{5}{6} - \frac{2}{6} = \frac{3}{6} = \frac{1}{2}$$

$$\Rightarrow \cancel{x = \frac{6}{3}} \boxed{x = 2}$$

Check!