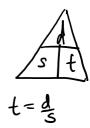
## PRF-CALCULUS 11

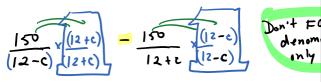
Ch 6 - Day 5: ADDING AND SUBTRACTING RATIONAL EXPRESSIONS (Part 2)



## MODELLING BY ADDING AND SUBTRACTING RATIONAL EXPRESSIONS

example: The *current* of a river is *c* miles per hour. A boat's speed in still water is 12 miles per hour. Write a simplified expression that will represent the *difference* in the times required for this boat to travel 150 miles *downriver* and *upriver*.







exercise: Ann and Bob drove separately the 300 km from Kamloops to Banff. They left at the same time. Ann drove x hours and arrived 1 hour before Bob. Write a simplified expression that represents how much faster Ann drove.



	Bob	Ann
distance	300 Km	300km
t	241	x
s	300 X+1	300 X

$$\frac{300}{x} \cdot \frac{(x+1)}{(x+1)} - \frac{300}{300} \cdot \frac{x}{x}$$

Ann's speed 
$$\frac{300}{x(z+1)}$$
 km/hr faster.

If it took her 3 hours, what was her speed?  $\frac{300}{x}$  (see above!)

Itime  $\frac{300}{3} = 100 \text{ km/hr}$ .

## COMPLEX FRACTIONS

fractions inside of fractions!

Complex fractions are rational expressions with fractions in the numerator and/or the denominator.

Complex fractions can be simplified in two ways.

- 1. Rewrite the numerator and denominator as single fractions and divide them.
- 2. Multiply the numerator and denominator by the lowest common denominator of

example: Evaluate  $\frac{8+2}{10}$ ; simplify your answer.

Rewrite numerical  $\frac{3}{10} - \frac{1}{1}$ ;  $\frac{1}{10} \cdot \frac{1}{10} \cdot \frac{$ 

$$\frac{\frac{40}{5} + \frac{2}{5}}{\frac{3}{10} - \frac{10}{10}}$$

χ

$$\begin{array}{c|c}
42 & -7 \\
\hline
5 & -7 \\
\hline
10 & Flip!
\\
42 & -10 \\
\hline
5 & -12
\end{array}$$

fractions inside the fraction => 2000 \$ 10.

Method 2
Mult. numerator + denominator
by that LCD of 10.

$$\frac{10\left(8+\frac{2}{5}\right)}{10\left(\frac{3}{10}-1\right)}$$

$$\frac{10(8) + 10\left(\frac{2}{5}\right)}{10\left(\frac{3}{10}\right) - 10(1)}$$

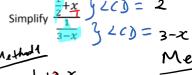
$$\frac{80+4}{3-10}$$

Ex 1: Simplify 
$$\frac{8-\frac{2}{1}}{\frac{5}{6}+\frac{1}{1}}$$
 \( \alpha = 6\)

Method 1

 $8 \times \frac{3}{6} - \frac{2}{1}$ 

$$\frac{\frac{8 \times \frac{3}{3} - \frac{2}{3}}{1 \times \frac{1}{3} \times \frac{1}{6}}}{\frac{5}{6} + \frac{1 \times \frac{6}{1}}{1}}$$

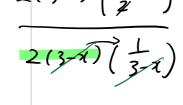


$$\frac{1}{2} + \frac{2}{2} \times \frac{1}{2} \times \frac{1}{3} - \frac{1}{3} = \frac{1}{12} + \frac{2}{3} \times \frac{1}{3} = \frac{1}{3} + \frac{2}{3} + \frac{2}{3} = \frac{1}{3} + \frac{2}{3} = \frac{1}{3} + \frac{2}{3} + \frac{2}{3} = \frac{1}{3} + \frac{2}$$

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

$$= \frac{3 - \chi + 6\chi - 2\chi^2}{2}$$

$$= \left[\frac{-2\chi^2 + 5\chi + 3}{2}\right]$$



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

**Assignment**: Sec 6.3, p. 337 #10, 12 (use hypotenuse = c in  $a^2 + b^2 = c^2$ ), 14, 20b, optional: 16, 25-27.