Mth 28, Homework 5 on section 7.3, 7.4
Due by Fri, Oct 24.

Write all your working out and answers neatly, using lots of space, and showing your steps clearly. Each question is worth 2 points.

Section 7.3 Simplify complex rational expressions

(1) Simplify the complex fraction: $\dfrac{\frac{2}{5} + \frac{4}{5}}{\frac{1}{5} + \frac{1}{10}}$

(Hint: combine the fractions on the top and bottom to get $\frac{6}{5} \div \frac{3}{10}$ first...)

(2) Simplify the complex rational expression: $\dfrac{\frac{4}{a^2} - \frac{1}{ab}}{\frac{3}{a} + \frac{8}{b}}$

(Your final answer should have $a(8a + 3b)$ on the bottom.)

(3) Simplify: $\dfrac{\frac{x}{x^2-4} + 1}{\frac{x}{x+2} - 1}$

(4) Simplify: $\dfrac{\frac{3x}{x-1} - \frac{1}{2}}{5x + 1}$

(5) Show the steps that simplify $\dfrac{\frac{x^2-3x}{x^2+2x-24}}{\frac{6x}{x+6} - x}$ down to $\dfrac{-x + 3}{x(x - 4)}$

Section 7.4 Solve Rational Equations

(6) Give an example of a rational expression and an example of a rational equation. What is the difference?

(7) Solve this rational equation using the following steps: $\dfrac{2}{x} + \dfrac{1}{2} = \dfrac{7}{6}$

   (a) Find the LCD of all the fractions on both sides. This is the smallest expression that has x, 2 and 6 as factors.

   (b) Multiply every term on both sides by this LCD. This clears away all the fractions.

   (c) Solve the linear equation you get in the usual way.

   (d) For rational equations it is important to check your answer works in the original equation and you are not dividing by zero anywhere. Any numbers that lead to division by zero are not solutions.

(8) Solve: $\dfrac{3}{x+4} + \dfrac{7}{x-4} = \dfrac{-4}{x^2-16}$

(Hint: use the same steps as the previous question.)

(9) Solve: $\dfrac{15}{x^2+x-6} - \dfrac{3}{x-2} = \dfrac{2}{x+3}$

(Does the solution you found really work in the original equation?)

(10) Solve: $\dfrac{y}{y+3} + 1 = \dfrac{-4}{y^2-9}$

(There are two solutions and one of them is $5/2$.)

If you get stuck on a question or aren't sure if you understand it:

- Go over the relevant class notes and section in the textbook.

- Check if you get the right answer for a similar odd-numbered question in the textbook (answers at the back of the book).

- Ask me about it after class.

- Come to my office hours: Mon 11:30 - 12:30, Wed 11:30 - 12:30 in CP 317.

- Go to the Math Tutorial Lab in-person in CP 303 or online.