Butterworth Math 120 Paper HW 10 , due 4/9

Reminders: Please **show all your work** neatly on this worksheet.
This should be some of your most careful work!

Name: _____

	Show your work neatly (when relevant). Place your answer in the box at the right	
1.	Add/Subtract: $\frac{1}{x} + \frac{4}{x^2 - 4} - \frac{2}{x^2 - 2x}$.	
2.	Simplify. $\frac{1}{x^2 + 3x - 4} \div \left(\frac{1}{x - 4} - \frac{1}{x + 2} \right)$.	
3.	Simplify: $\dfrac{\dfrac{x^2 - x}{2x^2 + x - 1}}{\dfrac{3x^3 - 9x^2 + 6x}{x^2 - x - 2}}$.	
4.	Solve. Don't forget to list restrictions: $\frac{x}{x - 3} = \frac{3}{x - 3} + 9$	
5.	Solve. Don't forget to list restrictions: $\frac{3}{x - 3} + \frac{5}{x - 4} = \frac{x^2 - 20}{x^2 - 7x + 12}$.	

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6.	Setup using a table, show the equation and solve the equation to answer the word problem. *A passenger train can travel 240 miles in the same amount of time it takes a freight train to travel the 160 miles. If the rate of the freight train is 20 miles per hour slower than the rate of the passenger train, find the average rate of each.*	
7.	If Lehmann were to ask the question in #6, he would have asked it in 3 parts. Part one would have been to set up total time as a function of rate of the passenger train. Show how you would have indicated the solution to #6 using function notation.	
8.	Setup using a table, show the equation and solve the equation to answer the word problem. *Engine A pulls a train 140 km. Then Engine B pulls the train 200 km. Engine B has a speed 5 km per hour faster than Engine A. If the total time required to move the train is 9 hours, find the rate at which Engine A pulls the train.*	
9.	Translate. Create an equation by finding k. Finally find y as directed. *y varies directly as x. y = 65 when x = 5. Find y when x = 9.*	

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10.	Translate. Create an equation by finding k. Finally find y as directed. *y varies inversely as x. y = 16 when x = 5. Find y when x = 4.*	
11.	Translate. Create an equation by finding k. Finally find y as directed. *y varies jointly as x and z. y = 25 when x = 5 and z = 2.* *Find y when x = 2 and z = 8.*	
12.	For the similar triangles shown. a) Show that AB: DE as AC: DF is in fact a true proportion. b) Find x. Show all work.