Solving Rational Equations II

1. Solve each of the equations using algebra (no calculator).

a) $\frac{3}{t} = 4 + \frac{23}{t}$

b) $\frac{3}{5y} + \frac{4}{3y} = -5$

c) $\frac{y}{2y+12} + \frac{6}{y+6} = 1$

d) $\frac{r-9}{r^2+6} = 0$

e) $\frac{t+9}{t^2+15t+54} = 0$

f) $-\frac{2}{x} - \frac{8}{x+7} = -1$

g) $\frac{1}{y-5} - \frac{5}{y^2-5y} = -\frac{1}{9}$

h) $\frac{2}{t+1} = \frac{3}{t-1} - \frac{2}{t^2-1}$

i) $\frac{2}{y+5} - \frac{5}{y+1} = -\frac{2}{y^2+6y+5}$

j) $-\frac{6}{r-3} + \frac{8r}{r+9} = -\frac{4}{r^2+6r-27}$

2. In still water a tugboat can travel 15 miles per hour. It travels 36 miles upstream and then 36 miles downstream in a total of 5 hours. Find the speed of the current.

3. A large pump can fill a 10,000-gallon tank 5 hours faster than a small pump. The large pump outputs water 100 gallons per hour faster than the small pump. Find the number of gallons pumped per hour by each pump.

4. It takes one painter 20 hours longer to paint a house than it does a more experienced painter. Together they can paint the house in 24 hours. How long does it take for each painter to paint the house working alone? (Please get used to problems like this. To use my table method, you need to recognize that *1 house* is being painted.)

5. Steve and Ann are editing a book for spelling and grammar errors. This requires meticulously reading each page and looking for corrections. If Steve would work alone, he would spend 60 hours editing the book. If Ann would work alone, she would spend 42 hours editing. If they work together (Steve starting from the front and Ann form the back) how long will it take them to finish editing?

6. A car passes another on a freeway traveling 2 miles per hour faster than the slower car. The faster car travels 340 miles in the time it takes the slower car to travel 325 miles. What is the speed of each car?