Math35 Midterm 3 Review

1. Solve the non-linear equations and check for extraneous solutions.
   a. \( \frac{3}{x} + \frac{5}{x+2} = 2 \)
   b. \( 2x = 1 - \sqrt{2-x} \)
   c. \( \frac{2}{3x+15} - \frac{1}{18} = \frac{1}{3x+12} \)
   d. \( \frac{2}{x+2} = \frac{7}{2x} \)
   e. \( \frac{5}{x+4} + \frac{1}{x+4} = x-1 \)
   f. \( \frac{x}{2} = 1 + \frac{12}{x} \)
   g. \( \frac{1}{x+5} = \frac{1}{3x+6} - \frac{x+2}{x^2 + 7x + 10} \)
   h. \( \sqrt{2x+6} - \sqrt{x+4} = 1 \)
   i. \( \sqrt{x+5} + 1 = \frac{6}{\sqrt{x+5}} \)
   j. \( 2\sqrt{x} = \sqrt{5x-16} \)
   k. \( x = \frac{\sqrt{16x-12}}{2} \)
   l. \( -x - 3 = 2\sqrt{5-x} \)
   m. \( \sqrt{10x+6} = 2\sqrt{y} \)

2. Graph the following function using a “t-table” of at least 3-values and state the domain and range.
   a. \( y = \sqrt{x - 5} + 2 \)
   b. \( y = \sqrt{5-x} + 2 \)
   c. \( y = \sqrt{x-2} \)
   d. \( y = \sqrt{2-x} \)

3. Find the quotient and remainder of \((3x^4 + 3x^3 - 2x^2 + 4x + 23) + (x^2 - 3x + 1)\) using long division and synthetic division.

4. The costs of a trucking company vary jointly as the number of trucks in service and the number of hours used. When 5 trucks are used for 8 hours each, the cost is $4,000. Find the cost of using 9 trucks, each for 5 hours. Set up the equation and then solve. Answer must be written in a sentence.

5. A train traveled 120 miles from Freeport to Chicago and returned the same distance in a total time of 5 hours. If the train traveled 20 mph slower on the return trip, then how fast did the train travel in each direction? Set up the equation and then solve. Answer must be written in a sentence.

6. The volume of rectangular prism is given by \( v = lwh \) (l=length, w=width and h=height). Find the width if the volume is \( 2x^3 + 15x^2 + 28x + 15 \), height is \( x+1 \) and the length is \( x+5 \). Box answer!

7. This is just a review, please look over your notes and if you have any other questions, please see me ASAP. Get this review done as soon as possible so you can have more time to study.