Name:_____

Practice Test #3 –Chapter 12
Intermediate Algebra – M120

Instructions: *All work must be shown in order to receive all points for all questions so practice showing all work. Practice* ***boxing your final answer****. Any answer that is a fraction must be in lowest terms and as mixed number for full credit. Since you can use a 5x8 notecard on the test use your notecard to practice or make one based on the problems you got wrong. Happy studying!*

1. Find the domain of the rational expression. Give it in set builder notation for full credit. Show all work.

$$f(x) = \frac{x - 5}{x^3 + 4x^2 - 9x - 36}$$

2. Simplify the rational expression. $\dfrac{x^2 - 81}{18 - 2x}$

3. Divide. Make sure your answer is in simplest form.

$$\frac{7x - 21}{x^2 - 11x + 30} \div \frac{x^2 - 9}{x^2 - 3x - 10}$$

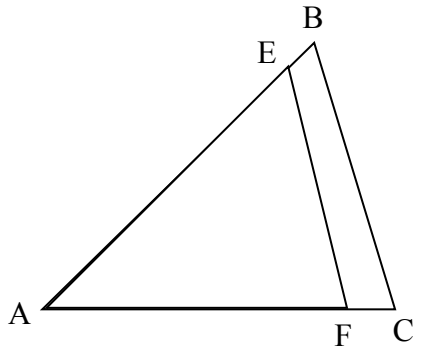
4. Using the two functions find $(f + g)(x)$

$$f(x) = \frac{2x + 1}{x^2 + 2x - 15} \quad \& \quad g(x) = \frac{3x - 2}{2x^2 - 5x - 3}$$

5. Simplify the following complex fractions. Show all work. Remember anything that can be factored must be even if it doesn't yield further simplification.

$$\frac{x - \dfrac{5}{x + 3}}{x + \dfrac{2}{x + 3}}$$

4. Find x using your knowledge of similar triangles **and then** find the length of $\overline{BC}$. Show all work.



If BC = (x – 9) feet & AC = 30 feet While EF = 4 feet and AF = (x + 5) feet

5. Solve the problem using a variation setup not proportions. Round your final answer to the nearest tenth if necessary.

The intensity, I (in watts per square meter, W/m^2), of a television signal varies inversely as the square of the distance d (in kilometers) from the transmitter. The intensity of the television signal is 2.5 W/m^2 at a distance of 10 km. Give a formula for the intensity and then use it to find the distance when the intensity is 4 W/m^2. ***Note****: Don't worry about the lack of agreement in distance units for intensity and distance.*

6. Solve. Box your final answers. Don't forget restrictions.

a) $\frac{1}{x-2} + \frac{1}{x+2} = \frac{4}{x^2-4}$

b) $\frac{5}{x+4} + \frac{3}{x+3} = \frac{12x+19}{x^2+7x+12}$

7. Eli and Connor took a boat trip. They traveled 6 miles upstream against a 2 mile per hour current. They turned around and traveled back downstream along the same course, with the same current, to their starting point. Their entire trip took 4 hours. What was their rate in still water?

a) Set up a table to solve this problem.

b) Write a function, T(x), that indicates total time as a function of rate in still water, x.

c) Give the representation of this problem using the function in b).

d) Solve this problem.