Math 1142 **First Day Of Class Review** **PJW**

This is a collection of problems involving skills of high school algebra and geometry that we may need in this course. Give them a try and discuss the troublesome ones with your TA.

1. Sketch the region in the plane defined by the inequalities

$$y \geq 0, \quad y \geq x, \quad x + 2y \leq 1.$$

2. Find $\frac{2}{7} + \frac{3}{8}$.

3. Simplify

$$\frac{\frac{1}{x+1} + \frac{1}{x}}{\frac{1}{x} - 1}$$

4. On a number line show the set of x such that $4 \leq x^2 \leq 9$ and $x < \frac{3}{2}$.

5. (Scientific calculator needed.) Solve the equation $2^x = 5$.

6. (Scientific calculator needed.) Solve the quadratic equation $x^2 - x - 1 = 0$ and find reasonably accurate decimal approximations for the roots.

7. Sketch the graph of $y = 2x^2 - 12x + 10$. Find x-intercepts (if any) y-intercepts (if any) and vertex, and label these on your graph.

8. Same question as above for the graph of $y = x(10 - x)$.

9. Find $1 + (.9) + (.9)^2 + \cdots + (.9)^9$.

10. Find $1 + 2 + 3 + \cdots + 50$.

11. I take a square piece of cardboard, 12 inches on a side. I cut a square notch out of each corner of the cardboard x inches on a side. Then I fold the sides up. What is the volume of the box-withou-a-top I have formed?

12. I take a circular pice of paper of radius 5 inches and cut it in half, and from each half form a cone-shaped drinking cup with (what else?!) duct tape. What total volume of water can the two cups together hold?

13. A streetlight is 15 feet above the pavement. A man standing on the pavement 10 feet away from the base of the lamp casts a shadow of length 5 feet. How tall is the man?

14. If cereal A has 50% more sugar per serving than cereal B, then cereal B has x% less sugar per serving than cereal A. Find x.