Mathematics 05 Fall 2005
Instructor : Nikolaos Apostolakis
First Exam
October 19 2005 **Name:** _____

Please do not turn this cover sheet until instructed to do so.

When the exam begins, please write your name on on the front page.

Please read the questions carefully and write your answers in the spaces provided on the question sheets. Justify your answers. **No credit will be given for unjustified answers.** Simplify your answers as far as you can. If you run out of room for an answer, continue on the back of the page.

Check your working carefully before submitting your paper.

There is a total of 1200 points. The perfect score however is 1000 points. There are 200 points of **Extra Credit**.

Calculators, computers, mobile phones and other electronic devices are not permitted.

You are required to turn in *all* of the question sheets with your name written in the top right-hand corner of the first page.

1. (150 points) Solve the following equation

$$2(3x - 1) + 2x + 5 = 5x - 2(x - 3) + 12$$

2. (150 points) Solve the following equation

$$\frac{x-2}{5}+\frac{8-x}{3}=x$$

3. (150 points) Find x if the perimeter of the following shape is 26.

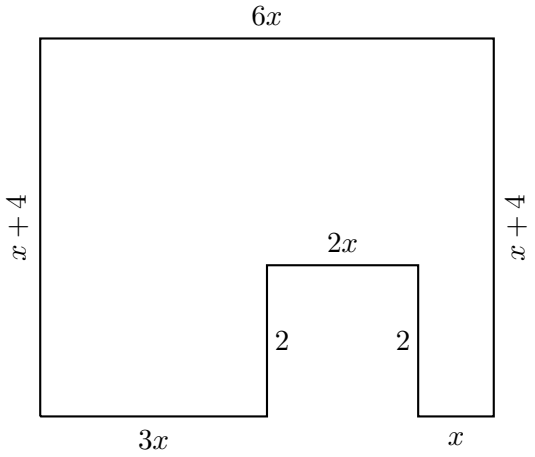

Figure 1: The shape

4. (150 points) How many liters of salt water with 30% concentration of salt do we need to mix with 10 liters of salt water with concentration 10% in order to get salt water with 20% concentration?

5. (150 points) John wants to invest \$10000 in two different plans. Plan A has an annual interest rate of 5% and plan B has an interest rate of 4%. How much should he invest on each plan if he wants at the end of the year to gain interest of \$450?

6. (150 points) Solve the following inequality

$$2(3-2x)+15 \geq -7x-3$$

and graph the solution set.

7. (150 points) Rachel's grade in a class will be determined by the average of the scores on three tests. She got a 75 on the first test and a 90 on the second. She wants to get a B + (or better) in this class. If B + starts at 87, what score would she need to get in the third test?

8. (150 points) Solve the following equation

$$|3x - 5| = |2x + 10|$$