HOMEWORK 4:

1.- Solve problem 9.8 from your textbook using Excel **solver**.

2.- A carpenter makes tables and chairs. Each table can be sold for a profit of $30 and each chair for a profit of $10. The carpenter can afford to spend up to 40 hours per week working and takes six hours to make a table and three hours to make a chair. Customer demand requires that he makes at least three times as many chairs as tables. Tables take up four times as much storage space as chairs and there is room for at most four tables each week.

Formulate this problem as a linear programming problem and solve for the optimum amount of chairs and tables that should be made per week. Use Excel **solver**.

3.- Find the positive root of the following equation:

$$f(x) = \frac{1.5x}{(1+x^2)^2} - 0.65\, Tan^{-1}\left(\frac{1}{x}\right) + \frac{0.65x}{(1+x^2)}$$

Plot the function *f(x)* to find an approximate solution to the problem. Use the approximate solution as a starting guess to find the exact root using Excel **goal seek**.

4.- Consider the simultaneous equations:

$$f_1(x,y) = y^2 - 2y - 8x - 23 = 0$$

$$f_2(x,y) = y^2 + 4x^2 + 4y - 8x - 8 = 0$$

Plot the functions *f₁(x)* and *f₂(x)* to find an approximate solution to the problem. Use the approximate solution as a starting guess to find the solution using Excel **solver**.

5.- Record a Macro to solve simultaneous systems of equations with 4 unknowns using matrix operations. Test your Macro with the following systems:

$$4x_1 + 2x_2 + x_3 + 5x_4 = 52.9$$

$$3x_1 + x_2 + 4x_3 + 7x_4 = 74.2$$

$$2x_1 + 3x_2 + x_3 + 6x_4 = 58.3$$

$$3x_1 + x_2 + x_3 + 3x_4 = 34.2$$

$$4x_1 + 2x_2 + x_3 = 13$$

$$2x_1 + 3x_2 + 1x_4 = 8$$

$$4x_2 - 1x_3 + 3x_4 = 4$$

$$2x_1 + x_2 + 4x_3 + 2x_4 = 19$$

Due date: Tuesday, March 6, 2012

1ˢᵗ EXAM: Thursday, March 8, 2012.

Please submit your Homework on time to the <u>cgn2420.section1@gmail.com</u> account. Use only ONE Excel file, with each problem in a different spreadsheet. Save the file with your NAME and LASTNAME. In addition print the homework and give it to your professor.

Homework that has not been submitted in this way will not be graded.