AOE/ESM 4084 - ENGINEERING DESIGN OPTIMIZATION

Fall Semester, 2000

Homework Assignment 3

Due 2.00 pm, Thursday, September 21

PROBLEM :

For the following problem

$$\textit{Minimize} \qquad x_1^2 + x_2^2 - 2x_1 - 2x_2 + 2$$

$$\textit{Subjected to} \qquad 2x_1 + x_2^2 \geq 5$$

$$x_1 + 2x_2 \geq 4$$

Solve the Kuhn-Tucker conditions, and check all the points for optimality (this should be done by taking each solution one at a time and stating the reasons to why it satisfies or violates the Kuhn-Tucker conditions, showing them graphically is optional). Also perform post optimality analysis to find the approximate value of the optimal solution for 7.5% and 15% decrease in the right hand side of the first constraint, respectively, and compare the results with the actual optima for those changes. State the reasons about agreement or disagreement.