DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

24.767 OPTIMIZATION METHODS FOR COMPUTER-AIDED DESIGN

ASSIGNMENT 1

Due Date: February 1, 2005   **Instructor: J. LoVetri, Rm. 350C**

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1) Let V be the vector space of polynomial functions $p : \mathbb{R} \to \mathbb{R}$ which have degree less than or equal to 2. Show that $B_1 = \{1, x, x^2\}$ and $B_2 = \{1, x + t, (x + t)^2\}$ for $t \in \mathbb{R}$ are both bases for this vector space and find the transformation matrices which transform the coordinates of any $p \in V$ between the two bases. Let D be the differentiation operator and show that it is a linear operator on the vector space V. Determine the matrix representation of D in B_1 and B_2. Call these M_1 and M_2, respectively, and determine the transformation equation between the two matrices.

2) Do problems 3.5 and 3.6 in the textbook.

3) Do problem 5.5, 5.8 and 5.9 in the textbook.