MATH 240 ASSIGNMENT 3, SPRING 2015

Due in class on Friday, February 6

Part 1. Do (but do not hand in) the following problems from DELA:

§4.3 T/F Review 5, 6, 7; Problems 17, 18

§4.5 T/F Review 2, 4, 8, 9; Problems 17, 26, 32

Note: §4.5, on the concept of *linear independence*, is important for the notions of *basis* and *dimension*.

§4.6 T/F Reviews 2, 4, 8, 10 ; Problems 12,

Part 2. Do and write up the following problems from DELA:

§4.2 Problem 16

§4.3 Problems 10, 21, 24

§4.4 Problems 12, 25, 26, 28

§4.6 Problems 19, 24, 28

Part 3. Extra credit problems:

(i) §4.5, Problem 40 of DELA

(ii) Let n be a positive integer. Let $x_1, \ldots, x_n$ be variables. Let A_n be the $n \times n$ matrix whose (i, j)-entry is x_{j-1}^{i-1}, for all $i, j = 1, \ldots, n$. (So the first row of A_n is $(1, 1, \ldots, 1)$, the second row of A_n is $(x_1, x_2, \ldots, x_n)$, the third row of A_n is $(x_1^2, x_2^2, \ldots, x_n^2)$, etc.) Show that

$$\det(A_n) = \prod_{1 \leq i < j \leq n} (x_j - x_i)$$