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 \( x_j - x_{j-1} \), 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 \((x_2^2, x_3^2, \ldots, x_n^2)\), etc.) Show that

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