

EXTRA CREDIT QUESTION 1

Show that the *Vandermonde* matrix

$$\begin{vmatrix} 1 & x_1 & \dots & x_1^{n-1} \\ 1 & x_2 & \dots & x_2^{n-1} \\ \vdots & \vdots & \ddots & \vdots \\ 1 & x_n & \dots & x_n^{n-1} \end{vmatrix} = \prod_{1 \leq i < j \leq n} (x_j - x_i).$$

In particular, the matrix is invertible if and only if $x_1, \dots, x_n$ are distinct.

Hint: use §3.2, Exercise 22.