1. Describe a sequence of row operations of the form of adding a multiple of one row to another and multiplying a row by a nonzero constant that has the same effect on the matrix as exchanging two rows. Use it to explain why interchanging two rows of a matrix multiplies its determinant by -1.

2. Say as much as you can about the determinant of the matrix

\[
\begin{pmatrix}
1 & x_0 & \cdots & x_0^n \\
1 & x_1 & \cdots & x_1^n \\
\vdots & \vdots & \ddots & \vdots \\
1 & x_n & \cdots & x_n^n
\end{pmatrix}.
\]

3. Explain why, if one of the matrices is not invertible, the product of the determinants of two \(n\) by \(n\) matrices is the determinant of their product.