# New linear algebra from Terry Tao

- Assume that $A$ is an $n \times n$ Hermitian matrix and $M_j$ is the matrix $A$ with the $j^{th}$ row and column removed.
- Notice that $M_j$ is also Hermitian.
- So suppose that $\lambda_1, \ldots, \lambda_n$ are the eigenvalues of $A$ and $\lambda_1^j, \ldots, \lambda_{n-1}^j$ are the eigenvalues of $M_j$ for each $j$.
- Finally, assume that a normalized eigenvector of $A$ for $\lambda_i$ has the form $(v_1^i, \ldots, v_j^i, \ldots, v_n^i)$.

**Theorem (Denton, Parke, Tao And Zhang)**

$$|v_j^i|^2 \prod_{k,k\neq i} (\lambda_i - \lambda_k) = \prod_{k=1}^{n-1} (\lambda_i - \lambda_k^j).$$