

1. Find a **nonzero** 2×2 matrix A such that $A^2 = 0$. Then do the same for a 3×3 .
2. Compute the QR factorization of the matrix

$$A = \begin{bmatrix} 1 & 2 & 3 \\ -1 & 0 & -3 \\ 0 & -2 & 3 \end{bmatrix}$$