1. Find the QR factorization of the matrix

$$A = \begin{bmatrix} 1 & 1 \\ 1 & 9 \\ 1 & -5 \\ 1 & 3 \end{bmatrix}$$

2. Find the best fitting function $f(t) = c_0 + c_1 t$ to data points $(1, 10), (9, 0), (-5, 0), (3, 0)$.

Hint: We wish to find the least-squares solution to

$$\begin{bmatrix} 1 & 1 \\ 1 & 9 \\ 1 & -5 \\ 1 & 3 \end{bmatrix} \begin{bmatrix} c_0 \\ c_1 \end{bmatrix} = \begin{bmatrix} 10 \\ 0 \\ 0 \\ 0 \end{bmatrix}.$$

Let $b = \begin{bmatrix} 10 \\ 0 \\ 0 \\ 0 \end{bmatrix}$ and solve the least-squares problem

$$\begin{bmatrix} c_0 \\ c_1 \end{bmatrix} = \arg\min_{x \in \mathbb{R}^2} \|Ax - b\|^2.$$

You don't need to multiply out the matrix product.