

III> For the matrix  $B = \begin{pmatrix} 1 & 1 \\ -1 & 1 \\ 0 & 1 \end{pmatrix}$

(a) Find QR factorization.

(b) Use the result in (a) to solve the least squares problem  $Bx = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}$ .

IV> (a) Find the best straight line fit to the measurements

| #     | (1) | (2) | (3) |
|-------|-----|-----|-----|
| $x_i$ | -1  | 0   | 1   |
| $y_i$ | 4   | 5   | 9   |

and graph your solution.

(b) In solving the problem in (a) you needed to formulate a <sup>and solve</sup> least squares problem  $A\bar{x} = \bar{b}$ . Identify  $A, \bar{b}$ , and find the projection of  $\bar{b}$  onto  $\mathcal{R}(A)$ .