

Name:

1. The matrix

$$A = \frac{1}{\sqrt{5}} \begin{bmatrix} 1 & -4 \\ 2 & 7 \end{bmatrix}$$

admits the QR factorization $A = QR$ with

$$Q = \frac{1}{\sqrt{5}} \begin{bmatrix} 1 & -2 \\ 2 & 1 \end{bmatrix}, \quad R = \begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix}$$

You don't need to show this. Instead, use the QR factorization to solve $Ax = b$ with

$$b = \sqrt{5} \begin{bmatrix} 1 \\ 3 \end{bmatrix}.$$

2. Find two different left inverses for the matrix

$$A = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}.$$