1. Text: 11.16. You can assume that A is 5×5. And don't bother with the "Does this make sense" part of the question.

2. Supplemental problem: 11.11. **Hint:** Consider block multiplication

$$\begin{bmatrix} A & a \end{bmatrix} \begin{bmatrix} B \\ 0 \end{bmatrix} = \begin{bmatrix} AB + a0 \end{bmatrix}$$

where A and B are 2×2, a is 2×1 and the 0 is a 1×2 zero row.

3. The matrix

$$A = \frac{1}{\sqrt{2}} \begin{bmatrix} 3 & -2 \\ -3 & -4 \end{bmatrix}$$

admits the QR factorization

$$A = \left(\frac{1}{\sqrt{2}} \begin{bmatrix} 1 & 1 \\ -1 & 1 \end{bmatrix} \right) \begin{bmatrix} 3 & 1 \\ 0 & -3 \end{bmatrix}$$

You don't need to show this. Instead, use the QR factorization to solve $Ax = b$ with $b = (3, -5)$.

Note: For a matrix as small as a 2×2, we wouldn't bother with QR factorization. We would simply write down the inverse matrix and use it to solve the system. The point of this problem is for you to get a little practice with what the the steps of solving the system with QR factorization actually are, without having to do an enormous amount of arithmetic.