

- Section 5.1: 6, 10, 28, 40, 42, 44, 46.
- Section 5.2: 2, 14, 16, 28, 32.
- Section 5.3: 5–11, 50(a).

**Problem 1.** (a) Find an orthonormal basis for the kernel of the following matrix:

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

(b) Find all possible solutions to

$$A\vec{x} = \begin{bmatrix} 0 \\ 11 \end{bmatrix}$$

(c) Find the solution  $\vec{x}$  to the linear system in part (b) that minimizes  $\|\vec{x}\|$ .