

## Homework 3 Problems

A. Use the Gram-Schmidt algorithm to find an orthonormal basis for the span of the vectors

$$x_1 = \begin{bmatrix} 1 \\ -1 \\ 0 \\ 0 \end{bmatrix} \quad x_2 = \begin{bmatrix} 1 \\ 2 \\ 1 \\ 0 \end{bmatrix} \quad x_3 = \begin{bmatrix} 1 \\ 0 \\ 0 \\ 1 \end{bmatrix}$$

inside  $\mathbb{R}^4$ .

B. Prove that, as a result of the Gram-Schmidt algorithm, every finite-dimensional inner-product space has an orthonormal basis.