

QUIZ 7

1. Consider the vectors below.

$$u_1 = \begin{bmatrix} 1 \\ 1 \\ 0 \end{bmatrix}, \quad u_2 = \begin{bmatrix} -1 \\ 1 \\ 0 \end{bmatrix}, \quad y = \begin{bmatrix} -1 \\ 4 \\ 3 \end{bmatrix}$$

- (a) (3 points) Verify that the set $\{u_1, u_2\}$ is an orthogonal set.

- (b) (3 points) Find the orthogonal projection of y onto $\text{Span}\{u_1, u_2\}$.

2. (4 points) Using the Gram-Schmidt process, produce an orthogonal basis for the subspace W below.

$$W = \text{Span} \left\{ \begin{bmatrix} 3 \\ -1 \\ 2 \\ -1 \end{bmatrix}, \begin{bmatrix} -5 \\ 9 \\ -9 \\ 3 \end{bmatrix} \right\}$$