Ex. 1.

Does the function

$$< \underline{x}, \underline{y} >= 3x_1y_1 - 2x_1y_2 - 2x_2y_1 + x_2y_2$$

satisfy the conditions imposed for a scalar product for vectors $\underline{x} = [x_1, x_2]$ and $\underline{y} = [y_1, y_2]$?

Ex. 2.

Use the Gram-Schmidt procedure to orthogonalize the system [0,1,1,0], [-2,0,2,0], [3,1,1,1] in E^4.

Ex. 3.

Let $\underline{u}$ = [1, 3, -2], $\underline{v}$ = [-1, 1, 1], $\underline{w}$ = [5, 1, 4].

a) Check if the system of vectors $\{\underline{u}, \underline{v}, \underline{w}\}$ is an orthogonal or othonormal basis of E^3.
b) Find the coordinates of the vector [1,0,1] in this basis.

Ex. 4.

Find the projection of vector [1, -1, 2, 0] onto the space spanned by vectors [2, 0, 1, -1], [1, 1, -2, 0] and [1, 1, 1, 3].