The test lasts 15 minutes. No documents are allowed. The use of a calculator, cell phone or other equivalent electronic device is not allowed.

1) Is the following matrix orthogonal

\[ A = \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix} \]

Solution. The two columns are not orthogonal

\[ \begin{bmatrix} 1 & 0 \end{bmatrix} \cdot \begin{bmatrix} -1 \\ 1 \end{bmatrix} = -1 \neq 0, \]

so the matrix is not orthogonal.

2) What are the Lagrange polynomials for the points \( x_0 = 0, \ x_1 = 1 \)?

As per the formula seen in class

\[ L_0(t) = 1 - t, \quad L_1(t) = t. \]