Important Instructions: This is a closed quiz. No cellphone, laptop or electronic devices. Calculators are allowed (except for symbolic calculators). Remember to write your solutions clearly. If you just write your final answers without justifying why you obtain your solutions, you will not get credits for that part. The duration of the quiz is 10 minutes. Late submission would not be accepted.

Problem 1.

(i) Find the inverse of the following matrix if it exists.

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

(ii) Let \( T : \mathbb{R}^2 \rightarrow \mathbb{R}^2 \) be the linear transformation defined by

\[ T \left( \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} \right) = \begin{bmatrix} x_2 \\ -x_1 + x_2 \end{bmatrix}. \]

Is \( T \) is invertible? Explain. If so, find a formula for \( T^{-1} \).