MATB24. Quiz #1, TUT #10

(1) (3 point) In each part, give a complete definition, or mathematical characterization of the word in bold: a **identity** of a binary operation

(2) (4 point) Give an example of a mathematical object that satisfies all the described properties or explain why such an example does not exists.

An invertible element in a set with a binary operation without an identity

(3) (8 point) Carefully prove the following statement.
Let $F(\mathbb{R}, \mathbb{R})$ denote the set of all functions with real domain and co-domain.[1] The set $S = \{f(x) = f(-x) | f \in F(\mathbb{R}, \mathbb{R})\}$ is a subspace of $F(\mathbb{R}, \mathbb{R})$.

[1] We also called this $\mathbb{R}^{\mathbb{R}}$ in lectures