Homework I

1. Let $f : A \to B$ and $g : B \to C$. If $g \circ f$ is surjective and g is injective, show that f is surjective.

2. Show that a unit circle defined by $x^2 + y^2 = 1$ is not a function in $\mathbb{R}$.

3. Let R be a relation on set A such that $\forall x, y \in A : xRy$. Show that R is an equivalence relation. Can this relation be an order relation?

4. Show that there are as many integers as there are odd integers.

5. Consider interval $[0, 10]$ in $\mathbb{N}$ ordered by $\leqslant$. What are the minimal, maximal elements? What are the minimum and the maximum of this interval? What are the least and greatest elements? What are upper and lower bounds? What are the supremum and infimum?