Set Theory Worksheet

Real Analysis

August 27, 2025

1 Exercises

I. Prove Theorem 2.2 (DeMorgan's law for sets).

II. Let $n \in \mathbb{N}$. Define the congruence modulo n relation on $\mathbb{Z}$ as follows

$$a \equiv b \mod n$$

if $(a - b) = nk$ for some $k \in \mathbb{Z}$, that is, n divides $(a - b)$. Show that the congruence modulo n relation is an equivalence relation.