

2nd Midterm

Foundations of Mathematics midterm makeup

2021 January 5

M3.1 Give an example of a set $A = \{1, 2, \dots, k\}$ for a smallest $k \in \mathbb{N}$ containing subsets A_1, A_2, A_3 such that $|A_i \setminus A_j| = |A_j \setminus A_i| = |i - j|$ for every two integers i and j with $1 \leq i < j \leq 3$.

M3.2 For which biconditional is its negation the following? n^3 and $7n + 2$ are odd or n^3 and $7n + 2$ are even.

M3.3 Prove in two different ways that if a is an odd integer, then $5a^2 - 3a + 5$ is odd.

M2.4 Prove that the real numbers \mathbb{R} and the positive real numbers \mathbb{R}^+ have the same cardinality