

Practice Examination 2

CS 313H

1. [10] For any sets A and B , prove that $A \sim (A \sim B) = A \cap B$.
2. [20] Using induction prove for $n \geq 2$, that $\prod_{k=2}^n (1 - \frac{1}{k^2}) = \frac{n+1}{2n}$.
3. [10] For any sets A and B , prove that $P(A \cap B) = P(A) \cap P(B)$.
4. [10] Given a set A and two symmetric relations R and S on A , prove or disprove with a simple counter-example: $R \circ S$ is symmetric.
5. [20] Consider the relation R on \mathbb{Z} , the set of integers: $R = \{(x, y) : x + y \text{ is even}\}$. Prove that R is an equivalence relation.