

Computability Assignment

Year 2013/14 - Number 9

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1 Definition

If \sim is an equivalence relation over a set A , a set $B \subseteq A$ is closed under \sim if $\forall x \in B \forall y \in A (y \sim x \Rightarrow y \in B)$.

2 Question

Let \sim be the relation over \mathbb{N} defined as $x \sim y$ if $|x - y|$ is a multiple of 3. Show that \sim is an equivalence relation and determine all sets of natural numbers closed under \sim .

Hint 1: there is only a finite number of such sets.

Hint 2: take a look at question 3 below.

2.1 Answer

Write your answer here.

3 Question

Let \sim be an equivalence relation over a nonempty set A . Prove that a subset $B \subseteq A$ is closed under \sim if and only if it is a (possibly empty) union of equivalence classes of elements of A (for the definition of equivalence class of an element of A , see point 1 of assignment 8).

3.1 Answer

Write your answer here.