Computability Assignment
Year 2012/13 - Number 8

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Please do not submit a file containing only the answers; edit this file, instead, filling the answer sections.

1 Question

Prove that the following set is **not** λ-definable.

$$A = \{\#M \mid \exists n \in \mathbb{N}.\ M\ulcorner n\urcorner =_{\beta\eta} \ulcorner 5 \urcorner\}$$

1.1 Answer

Write your answer here.

2 Question

Prove that the following set is semantically closed. Then, prove that it **is** λ-definable.

$$A = \{\#M \mid \forall N \in \Lambda.\ N\ M =_{\beta\eta} \mathbf{I}\}$$

2.1 Answer

Write your answer here.

Note.

The following exercise is harder. Feel free to skip it.

3 Question

Prove **whether** the following set is λ-definable.

$$A = \{\#M \mid M^\ulcorner M^\urcorner =_{\beta\eta} M\}$$

(Note: there is at least one simple solution to this. You do not need to try huge formulae for this.)

3.1 Answer

Write your answer here.