

Special Topics on Applied Mathematical Logic
Spring 2012
National Taiwan University

Problem Set 1

Due on 2012/03/20

Drop your solution in the instructor's mail box at EEII building by 18:00pm

1 [Countable Sets]

Prove that the union of countably many countable sets is countable.

2 [Uncountable Sets]

Show that \mathbb{R} , the interval $(0, 1] \subseteq \mathbb{R}$, and $\mathcal{P}\mathbb{N}$ are equinumerous.

3 [Well-Formed Formulas – Sentential Logic]

Let ϕ be a wff; let c (respectively s) be the number of places at which binary connective symbols $\wedge, \vee, \rightarrow, \leftrightarrow$ (respectively sentence symbols) occur in ϕ . Show by induction that $s = c + 1$.

4 [Truth Assignments – Sentential Logic]

Exercises 4 and 7 of Section 1.2.

5 [Sentential Connectives – Sentential Logic]

Exercises 3, 10, and 11 of Section 1.5.