
Complexity Theory

Due date: July 10, 2012 before class!

Problem 1 (10 Points)

Show that

- (i) **RP** and **BPP** are closed under \preceq_m^p ,
- (ii) **RP** and **BPP** are closed under union and intersection.

Problem 2 (10 Points)

Show that, if $\mathcal{NP} \subseteq \mathbf{BPP}$, then $\mathbf{RP} = \mathcal{NP}$.

Problem 3 (10 Points)

Show that **RP** does not change if we replace in the definition $\geq 2/3$ by $\geq n^{-k}$ or by $1 - 2^{-n^k}$.

Problem 4 (10 Points)

Prove that $\mathbf{ZPP} = \mathbf{RP} \cap \text{co-RP}$.