Mathematisches Institut
der Universität Bonn
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Summer Semester 2009
June 8, 2009
Exercise Sheet 6

Exercises for

Models of Set Theory I

Let in the following M be a ground model, $(\mathbb{P}, \leq_{\mathbb{P}}, 1_{\mathbb{P}}) \in M$ be a forcing and G be a M-generic filter on $\mathbb{P}$.

21. (a) Assume that $x, y \in M[G]$. Prove that also $x \times y \in M[G]$.

(b) Let $\dot{x}, \dot{y} \in M$ be names for $x, y \in M[G]$. Define a name $\dot{z} \in M$ for $(x, y) \in M[G]$.

22. Assume that G is a filter on $\mathbb{P}$, which is not necessarily generic. Prove that $M[G] = M$ if $G \in M$.

23. Let $\mathbb{P}$ be Cohen forcing. Prove that there exists in $M[G]$ an $a \subseteq \omega$ such that $a \notin M$.

24. Let $D \subseteq \mathbb{P}$, $D \in M$ and $p \in G$. Assume that $\forall q \leq p \; \exists r \in D \; r, q$ compatible. Show that $G \cap D \neq \emptyset$.

Every problem will be graded with 8 points.

Please hand in your solutions during the lecture at June 15, 2009.