Mathematisches Institut
der Universität Bonn
P. Koepke, B. Irrgang

Winter 09/10
October 26, 2009
Exercise Sheet 2

Exercises for

Models of Set Theory II

5. Let $\mathbb{P}$ and $\mathbb{Q}$ be forcings. Show that $\mathbb{P} \times \mathbb{Q}$ and $\mathbb{P} * \check{\mathbb{Q}}$ are isomorphic.

6. Let $\mathbb{P}$ and $\mathbb{Q}$ be ccc forcings. Show that $\mathbb{P} \times \mathbb{Q}$ satisfies ccc if and only if $1_{\mathbb{P}} \Vdash (\check{\mathbb{Q}}$ is ccc).

7. Let $(T, \leq)$ be a Suslin tree and $\mathbb{C}_\kappa$ be the forcing that adjoins κ Cohen reals. Let G be $\mathbb{C}_\kappa$-generic. Show that T is a Suslin tree in $V[G]$.

Hint: Consider the forcing $\mathbb{P} = (T, \geq)$ and use exercise 6 to show that $\mathbb{P}$ has ccc in $V[G]$.

8. Assume GCH. Recall that for every regular cardinal $\kappa \geq \omega$ there exists a family $\langle f_\alpha \mid \alpha < \kappa^+ \rangle$ of almost disjoint functions $f_\alpha : \kappa \to \kappa$. Let $X \subseteq \kappa^+$. Define a cardinality preserving forcing $\mathbb{P}$ which adds a function $f : \kappa \to \kappa$ such that

$$\alpha \in X \quad \text{iff} \quad f \text{ and } f_\alpha \text{ are almost disjoint.}$$

Every problem will be graded with 8 points.

Please hand in your solutions during the lecture at November 2, 2009.