Homework Week 9
Due 14 January 2019

1. Complete the proof of direction (2*b*) from the proof of the main Lemma of the lecture, i.e., show that if $\pi_G \in \tau_G$ then $\exists p \in G$ such that $p \Vdash^* \pi \in \tau$.

   Note: the proof is in Kunen's textbook, so please try to write the proof in your own words and giving more detail than Kunen. [3 points]

2. Prove the example given in the lecture, that in the specific case where $\tau^1 = \{(\pi^1, s)\}$ and $\tau^2 = \{(\pi^2, s)\}$, we have that $p \Vdash^* \tau^1 = \tau^2$ iff $\forall q \leq \{p, s\}\ q \Vdash^* \pi^1 = \pi^2$. [4 points]

3. Prove the inductive rule for forcing a disjunction: $p \Vdash \phi \vee \psi$ iff $\{q \leq p\ :\ q \Vdash \phi \vee q \Vdash \psi\}$ is dense below p. You may do this either by reducing $\phi \vee \psi$ to a statement with conjunctions and negations, or use the definition of the semantic relation and prove the statement directly. [3 points]