Math 116a

Assignment # 3
Due Tuesday, October 27 at 1:00 pm.

Please read first the homework policy in the Math 116a web page.

1) Exercises 2.5.3, 2.5.4, 2.5.7 from Marker’s book.

2) Let $\mathcal{L}$ be a first order language and let $\mathcal{C}$ be a class of structures in $\mathcal{L}$. Denote by $\mathcal{C}'$ the class of structures that are not in $\mathcal{C}$. Show that if both $\mathcal{C}$ and $\mathcal{C}'$ are elementary, then there is a single sentence $\sigma$ such that $\mathcal{C} = \{M : M \models \sigma\}$.

3) Consider the language of rings. Let $\sigma$ be a sentence in this language that is true in every field of characteristic 0. Show that there is a number $p$ such that $\sigma$ is true in every field of characteristic at least $p$. Conclude that the theory of fields of characteristic 0 is not finitely axiomatizable.

The starred problem is 2.5.7.