Math 6140: Homework 9

1. 13.5: 3, 4, 6, 7, 10
2. Suppose $\text{char}(\mathbb{F}) = p > 0$, and $\mathbb{K}/\mathbb{F}$ is an algebraic extension. Show that the following are equivalent.
   (a) The only elements in $\mathbb{K}$ that are roots of a separable polynomial in $\mathbb{F}[x]$ are in $\mathbb{F}$.
   (b) If $\alpha \in \mathbb{K}$, then there exists $n \in \mathbb{Z}_{\geq 0}$ such that $\alpha^{p^n} \in \mathbb{F}$.