1. Problem 1.10 from Stark and Woods.

2. Problem 1.13 from Stark and Woods.

3. If a field $\mathcal{F}$ contains sets $A$ and $B$, show that $\mathcal{F}$ also contains the sets $A \setminus B$ and $A \triangle B$.

4. Show that if a collection $\mathcal{F}$ of subsets of $\Omega$ is closed under complementation and \textit{countable} unions, it is also closed under \textit{countable} intersections.

5. Let $\mathcal{F}$ be a $\sigma$-field of subsets of $\Omega$ and fix a set $B \in \mathcal{F}$. Show that $\mathcal{G} = \{ A \cap B : A \in \mathcal{F} \}$ is a $\sigma$-field of subsets of $B$.

$\mathcal{G}$ is called the “\textit{restriction of }\mathcal{F}\text{ \textit{to } }B\text{,” or “}\mathcal{F} \text{ \textit{restricted to } }B\text{.”}