1. (*) Read Kolmogorov and Fomin, Chapter 2, especially Sections 5 and 6.

2. (*) Read Sally, Chapter 2.

3. (*) Read Sally, Chapter 4.

4. Determine $\text{Aut}_R(C)$, the collection of field automorphisms of $C$ which fix $R$ pointwise.

5. Sally, Section 4.2, Exercises (*4.2.4, (*4.2.5, 4.2.8, 4.2.9, and 4.2.10.

6. Sally, Section 4.3, Exercises 4.3.5, 4.3.6, (*4.3.11, (*4.3.14, (*4.3.21, 4.3.24, 4.3.25, (*4.3.26, 4.3.27, 4.3.28, 4.3.29, (*4.3.32, 4.3.33, (*4.3.35, 4.3.38, 4.3.40, 4.3.42.

7. If we denote the closure of a set $A$ in a metric space by the notation $\overline{A}$, prove the following:
   (a) If $A \subset B$, then $\overline{A} \subset \overline{B}$.
   (b) $\overline{A} = \overline{A}$
   (c) $\overline{A \cup B} = \overline{A} \cup \overline{B}$

8. Do Sally, Project 4.6.1, on General Point Set Topology, parts 1 (Basic Notions) and 2 (Separation Properties).

9. Minkowski’s Inequality states that for $p \geq 1$:
   If $a = (a_1, \ldots, a_n)$ and $b = (b_1, \ldots, b_n)$ are in $\mathbb{R}^n$, then
   $\left( \sum_{k=1}^{n} |a_k + b_k|^p \right)^{1/p} \leq \left( \sum_{k=1}^{n} |a_k|^p \right)^{1/p} + \left( \sum_{k=1}^{n} |b_k|^p \right)^{1/p}$.
   (a) Prove Minkowski’s Inequality.
   (b) Show that Minkowski’s Inequality is false for $0 < p < 1$.

10. Let $X = \mathbb{R}^n$ with the usual metric. Show that the only subsets of $X$ that are both open and closed are $\emptyset$ and $X$ itself.