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Sheaves in Topology (Master)
Summer Semester 2025

Sheet 8

Question 8.1

(a) Show that any flabby sheaf is c-soft.

(b) Show that the sheaf of continuous functions on a locally compact topological space is c-soft.

Hint: Recall Urysohn's lemma.

Question 8.2

Compute the cohomology $H^*(\mathbb{R}P^2, \underline{A})$ for an arbitrary abelian group A.

Question 8.3

Let $X = U \cup V$ be a union of open sets. Formulate and prove a Mayer-Vietoris theorem for compactly supported cohomology of the sheaf $\underline{R}$ on X.
Hint: First find a map $i_! i^{-1}\mathcal{F} \to \mathcal{F}$ for any open inclusion $i : U \to X$ and sheaf $\mathcal{F}$ on X

Question 8.4

* Compute $H_c^*((0,1), \underline{\mathbb{Z}})$.

These questions will be discussed in the exercise class on 13 June 2025.
Questions with an asterisk are more challenging.