

MAT 541: Algebraic Topology

Suggested Problems for Week 5

You may hand in solutions to at *most* 2 problems every 2 weeks and no later than 2 weeks after the necessary material for them is covered in class.

From Munkres: 15.1, 15.2, 17.1-3, 18.1-3

Problem J

Let K be a simplicial complex of dimension n (the maximal dimension of the simplices) and K^m be its m -th skeleton (the union of all simplices of dimension at most m). Show that $K - K^m$ is a union of open subsets U_{m+1}, \dots, U_n such that all possible intersections

$$U_{i_1} \cap \dots \cap U_{i_k} \subset K, \quad i_1, \dots, i_k \in \{m+1, \dots, n\}, \quad k \in \mathbb{Z}^+,$$

are disjoint unions of contractible open subsets of K .