1. Verify the claims in 3.15.5X:

(a) The set of all faces of an \( n \)-simplex \( s_n \) is a simplicial complex of dimension \( n \).

(b) The set of all proper faces of an \( n \)-simplex \( s_n \) is an \( (n - 1) \)-dimensional simplicial complex.

2. 3.17.1X. Suppose \( K_1 \) and \( K_2 \) are subcomplexes of the simplicial complex \( K \).

(a) Then \( K_1 \cup K_2 \) is a subcomplex of \( K \).

(b) Then \( K_1 \cap K_2 \) is a subcomplex of \( K \).

(c) Is \( K_1 \setminus K_2 \) a subcomplex? If your answer is “yes,” prove it. If your answer is “no,” give a counterexample.

3. Suppose \( K \) is a simplicial complex such that \( |K| \subseteq \mathbb{R}^N \). Show that \( |K| \) is a closed subset of \( \mathbb{R}^N \). You can assume that any \( n \)-simplex is compact.