

Math589 Homework 10

Note: To submit the k-th homework, simply put your files in the folder HWk on CoCalc, and it will be collected on the due day.

1. Recall the following two versions of the Borsuk–Ulam Theorem.

(BU1b) For every antipodal mapping $f : S^n \rightarrow \mathbb{R}^n$, there is a point $x \in S^n$ such that $f(x) = 0$.

(BU2a) There is no antipodal mapping $f : S^n \rightarrow S^{n-1}$.

Show that they are equivalent.

2. Let T be a triangulation of B^2 , as shown below, that is antipodally symmetric on the boundary. Label the vertices $V(T)$ by $\{\pm 1, \pm 2\}$ such that it is antipodal on the boundary, then indicate all complementary edges by red lines.

Solution.

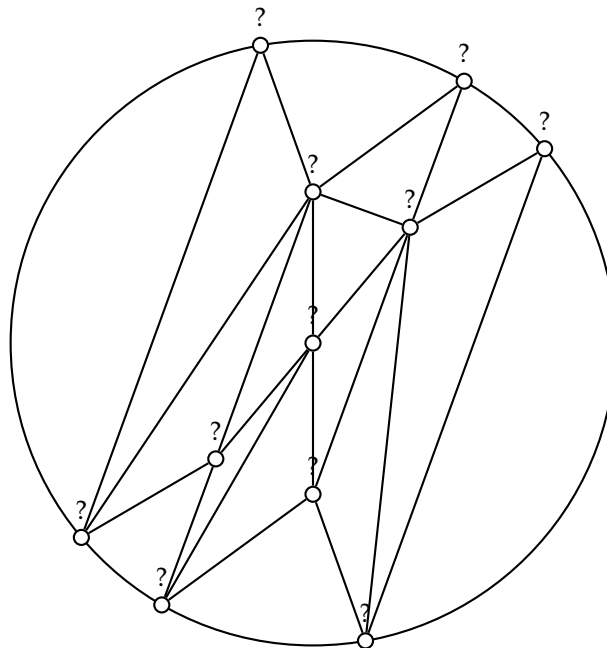


Figure 1: A triangulation T of B^2