

1. **Evasiveness.** Read the article *Evasiveness of Graph Properties and Topological Fixed-Point Theorems*¹ by Carl A. Miller, and Section 3 and 4 of the article *Using Brouwer's fixed point theorem*² by Björner, Matoušek, and Ziegler.
 - (a) Complete the proof in class on evasiveness by showing that K_p is not topologically trivial when the number of vertices is a *prime power* (K_p is the complex constructed for the monotone symmetric property P). You may use the *Oliver's fixed point theorem* explained in the articles without proof.
 - (b) Prove that any nontrivial monotone symmetric property needs at least $n^2/4 - o(n^2)$ edge queries. (Notice that here we don't have the prime power assumption on the number of vertices.)
 - ★(c) Improve the edge-query bound to $(\frac{1}{4} + \delta)n^2 - o(n^2)$ for some $\delta > 0$. What is the best lower bound you can get?

¹<https://arxiv.org/pdf/1306.0110.pdf>

²<https://arxiv.org/pdf/1409.7890.pdf>