

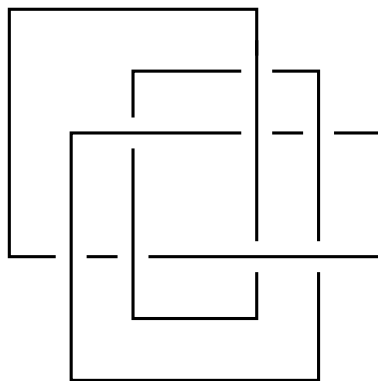
These exercises are mainly taken from the second week's lectures. Please do let me know if any of the problems are unclear or have typos.

Exercise 2.1. Show that the standard diagram of the Borromean rings cannot be 3-colored. Now argue that the Borromean rings are not splittable.

Exercise 2.2. Draw a shadow where at least two of the regions are not disks.

Exercise 2.3. Suppose that the diagram D has shadow S . Suppose that S has at least two regions which are not disks. Show that D is splittable.

Exercise 2.4. Label the diagram given. Find a dependency among its coloring equations.



Exercise 2.5. Draw the complete graph on four vertices, K_4 . Show that the regions of K_4 cannot be two (or even three) colored. Locate precisely where the proof that all shadows are two colorable breaks down for K_4 .