

Geometric Graph Theory

2. Exercise, 3. March, 2010
Wednesday 1015-1145*, MA A1 10

1. Show that you can draw K_5 , $K_{3,3}$ and the Petersen graph in the *torus* without intersecting edges. (The torus is the surface of a donut, the easiest way to represent it is a square such that if an edge exits one of its sides, then it returns on the opposite side.)
2. What is the equivalent of Euler's formula in the torus?
3. Show that you can embed K_7 in the torus but not K_8 .
4. Give a straight-line drawing of K_4 in an as small grid as possible. Prove that this is optimal.
5. (HW) How many colors do we need at most to color a graph embeddable in the torus?
6. * For which a and b can you embed $K_{a,b}$ in the torus?

New exercises and notes can be found at <http://dgc.epfl.ch/page85509.html>

Solutions to selected homeworks should be handed in at the beginning of the next session or sent to doemoe-toer.palvoelgyi@epfl.ch.