

Geometric Graph Theory

4. Exercise, 17. March, 2010
Wednesday 1015-1145*, MA A1 10

Definition: We say that a graph is a *thrackle* if it has a planar drawing where neighboring edges are non-crossing and every two non-neighboring edges cross an odd number of times.

1. a) Draw C_3 as a thrackle.
b) Draw C_6 as a thrackle.

Definition: We say that a graph is an *odd-thrackle* if it has a planar drawing where every two neighboring edges cross an even and every two non-neighboring edges cross an odd number of times.

2. Is the Petersen-graph an odd-thrackle?
3. Show a graph that is an odd-thrackle but not a thrackle.
4. Show that if a bipartite graph contains a subdivision of $K_{3,3}$, then it is not an odd-thrackle.
5. Planar bipartite graphs are odd-thrackles.
6. (HW) Prove that any cycle of length at least five can be drawn as a thrackle.
7. * At most how many edges can an odd-thrackle have? Prove lower/upper bounds.

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.