Graph Theory 2

Exercise Sheet 5

due on November 23, 1pm

http://bit.ly/2zH9VEu

Exercise 1 (§5.34)   [1 Punkt]

Prove that every directed graph without odd directed cycles has a kernel.

Exercise 2 (§5.35)   [1 Punkt]

Show that every bipartite planar graph is 3-list-colourable.

Hint: Use Exercise 1 and Lemma 5.4.3.

Exercise 3 (§5.39)   [1 Punkt]

Use König's theorem (Theorem 2.1.1) to show that the complement of any bipartite graph is perfect.

Exercise 4 (§5.41)   [1 Punkt]

A graph is called a *comparability graph* if there exists a partial ordering of its vertex set such that two vertices are adjacent if and only if they are comparable. Show that every comparability graph is perfect.

Written Exercise (§5.31)

Prove for every $r \in \mathbb{N}$ that the choice number of the complete r-partite graph with vertex classes of size two is r.