

# Homework 4

*Due: 27th of April, 2018*

This homework may be done in groups. Everyone in the group is responsible for knowing how to solve all of the problems. Your group needs to meet (as a group!) at least twice.

## Problems

1. Is it true that if  $G$  is a regular graph with more than two vertices, then either  $G$  or  $\bar{G}$  is hamiltonian? If so, prove it; if not, provide a counter example.
2. Is  $\chi'(G) = \chi(L(G))$ ? Why or why not?
3. What is the chromatic number of:
  - (a) each of the Platonic graphs?
  - (b) the Petersen graph?
  - (c) the complete tripartite graph  $K_{r,s,t}$
4. Show that  $\overline{C_n}$  is planar for  $n \leq 6$  and not planar for  $n \geq 7$ .
5. Find all the self-complementary graphs with eight or fewer vertices.