

## Exercise Sheet 04

Deadline for submission is Friday May-27-22, 23.59h at your Olat course

### Task 1

3 p.

Let  $G$  be a plane drawing of a connected planar graph. Let  $n$  and  $m$  denote the number of vertices and edges and let  $n \geq 3$ . Show:

$$m \leq 3n - 6$$

### Task 2

5 p.

Show: Each planar graph can be colored with five colors.

### Task 3

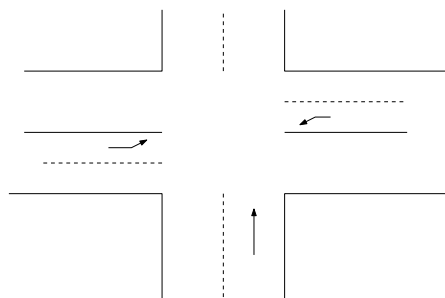
2 p.

Show: Let  $t = \binom{2k-1}{k}$  then  $K_{t,t}$  is not  $t$ -list-colorable.

### Task 4

2 p.

Construct an ideal traffic light circuit for the following intersection with node coloring.



Task	1	2	3	4	total
Points	3	5	2	2	12
reached					