

## **Exercise Set 7**

**Exercise 7.1** Show that all forests are bipartite.

(6 Punkte)

**Exercise 7.2** Let  $n \geq 2$ , and let  $v$  and  $w$  be arbitrary vertices of a complete graph  $K_n$ . Compute  $p_n$  - the number of paths from  $v$  to  $w$ . What is the limit of  $p_n/(n-2)!$  when  $n$  goes to infinity?

(6 Punkte)

**Exercise 7.3** (1) Find, up to isomorphism, all unicyclic graphs on 6 vertices. (3 Punkte)  
(2) Assume  $n \geq 5$ . Up to isomorphism, how many unicyclic graphs on  $n$  vertices have a cycle of length larger or equal to  $n-2$ . (3 Punkte)

**Exercise 7.4** Prove that a 3-path (a path with 3 edges) is the only tree whose complement is also a tree.

(6 Punkte)

**Submission of the exercises:** Tues, 09.12.25, before the tutorial (until 12:15) into the postbox 54 in MZH 1st floor, or submission at the beginning of the 12:30-tutorial.