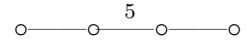
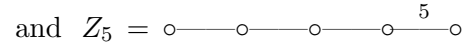
**Übungen zu Gruppentheorie — Blatt 7** **TU Kaiserslautern**
**Dr. C. Lassueur** **SS 2015**

**Exercise** 1.
Compute $\det(\Gamma)$ for each graph $\Gamma$ in List I and List II (Chapter 6, §3 of the Lecture).

**Exercise** 2.
Compute $\det(Z_4)$ and $\det(Z_5)$.
(Where $Z_4 =$  and $Z_5 =$  .)

**Exercise** 3.
Assume $\Gamma_W$ is an irreducible Coxeter graph. Let $V$ be the associated $\mathbb{R}$-vector space with basis $\{e_1, \ldots, e_n\}$, and assume that the associated bilinear form $B$ is positive semi-definite. Let $v \in V$ and write $v = \sum_{i=1}^{n} \lambda_i e_i$, where $\lambda_i \in \mathbb{R}$ for any $1 \leq i \leq n$. Show that if $B(v, v) = 0$ and $v \neq 0$, then $\lambda_i \neq 0$ for any $1 \leq i \leq n$.