

# Povzetek/ Abstract

Diplomsko delo je razdeljeno na štiri poglavja. V prvem poglavju govorimo o osnovnih pojmi, ortogonalnih transformacijah v dvo in trodimenzionalnem prostoru, predstavimo nekaj končnih podgrup v dveh in treh dimenzijah in njihove invariante. V drugem poglavju obravnavamo fundamentalna območja in korenske sisteme, ki jih natančneje pogledamo na primerih Coxeterjevih grup. V tretjem poglavju definiramo Coxeterjev graf, njegovo pozitivno definitnost, povezavo s korenskimi sistemi in določimo kristalografski pogoj. V četrtem poglavju pa se na kratko dotaknemo polinomskih invariant grup.

The work is divided into four chapters. The first chapter introduces some of the terminology used later, orthogonal transformation in two and three dimensions and gives us presentations of certain finite subgroups in two and three dimensions and their invariants. In the second chapter we meet the notion of a fundamental region and of root systems. We also analyze in details the Coxeter groups. In the third chapter we defines Coxeter graph, its positive definiteness and its connection of the root systems. At the end the crystallographic condition is determined. The last chapter gives a brief presentation of polynomial invariants of groups.

**Math. Subj. Class. (MSC 2000):** 55M35, 33C52, 51F15, 20F55, 14L24, 16W22

**Ključne besede:**

ortogonalne transformacije, zrcaljenja, končne grupe, fundamentalna območja, korenski sistemi, Coxeterjeve grupe, Coxeterjevi grafi, pozitivna definitnost, kristalografski pogoj, polinomske funkcije, polinomska invarianta

**Keywords:**

orthogonal transformations, reflections, finite groups, fundamental regions, root systems, Coxeter groups, Coxeter graphs, positive definiteness, crystallographic condition, polynomial functions, polynomial invariant

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