

# Coxeter groups via Cartan matrices

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In this talk, based on my master thesis, we will see how we can study Coxeter groups with the use of Cartan matrices. Cartan matrices constitute a family of matrices with specific properties. We will discuss Matsumoto's theorem, as well as the cancellation law, both very important for Coxeter groups. Moreover, we will present the classification of finite Coxeter groups with the use of Dynkin diagrams. We will define root systems and use them to describe the generators of a Coxeter group. Finally, we will look at the longest element and its properties.