Diagrammatic Categories in Representation Theory
Honours Thesis

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Background

Notation: we write 1 for the neutral element of a group.

2.1 Coxeter Groups

Definition 2.1.1. A *Coxeter system* (W, S) is a group W and a finite subset $S = \{s_1, ..., s_n\} \subset W$ under the following conditions. For any $s, t \in S$ there exists $m_{st} \in \mathbb{Z}_{>0} \cup \{\infty\}$ such that $(st)^{m_{st}} = 1$, where $m_{st} = 1$ if $s = t$, and $m_{st} \in \{2, 3, ...\} \cup \{\infty\}$ if $s \neq t$. In other words, $W = \langle s \in S \mid (st)^{m_{st}} = 1 \rangle$ with generator S. We call W a *Coxeter group*.

Note that $m_{st} = \infty$ indicates there are no relations of the form $(st)^m = 1$ for any $m \in \mathbb{Z}_{>0}$.

The first

2.2 Hecke Algebra