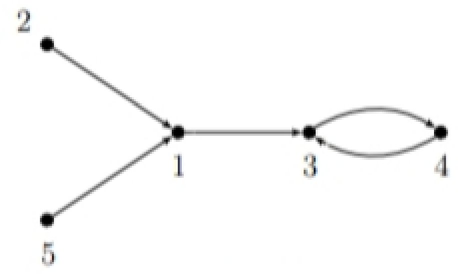
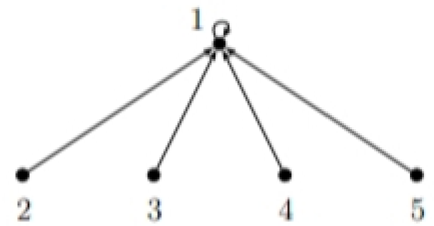


Now α has a tail with length $\geqslant 2$ and therefore α doesn't lie in any subgroup.

(2) Let us take the constant element $c_1 \in \mathcal{T}_5$

$$c_1 = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 1 & 1 & 1 & 1 & 1 \end{pmatrix}.$$

This has the following map diagram



Now c_1 has no tails of length $\geqslant 2$, therefore c_1 lies in a subgroup and hence c_1 lies in a subgroup. Note that actually $c_1^2 = c_1$.

Now for any β,

$$\begin{aligned} \beta \in H_{c_1} &\Leftrightarrow \beta \,\mathcal{H}\, c_1, \\ &\Leftrightarrow \beta \,\mathcal{R}\, c_1 \text{ and } \beta \,\mathcal{L}\, c_1, \\ &\Leftrightarrow \ker\beta = \ker c_1 \text{ and } \operatorname{Im}\beta = \operatorname{Im} c_1, \\ &\Leftrightarrow \ker\beta \text{ has classes } \{1,2,3,4,5\} \text{ and } \operatorname{Im}\beta = \{1\}, \\ &\Leftrightarrow \beta = c_1. \end{aligned}$$

Therefore the maximal subgroup containing c_1 is $H_{c_1} = \{c_1\}$.

(3) Take the element

$$\alpha = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 2 & 3 & 2 & 3 & 5 \end{pmatrix}.$$

This has map diagram