ⓘ Info

This note, that was found here, as a part of a collection
is written (completely with human hands) by Rupadarshi Ray,
was created on April 19, 2024 12:29:15 AM,
was last modified on May 17, 2026 7:36:38 PM, and
was exported on September 7, 2026 3:04:02 PM.

Hecke algebras

Definition. Hecke algebras $H_n^R(q,z)$

The Hecke algebra $H_n^R(q,z)$ is the unital associative R-algebra generated by

$$T_1, T_2, \ldots, T_{n-1}$$

with the relations

- $|i-j| \geq 2 \implies T_i T_j = T_j T_i$
- $T_i T_{i+1} T_i = T_{i+1} T_i T_{i+1}$
- $T_i^2 = z\, T_i + q\, 1_H$

where R is a commutative ring and $z \in R, q \in R^\times$.

The elements are a linear combination of monomials

$$T_{i_1} T_{i_2} \ldots T_{i_r}$$

look like

$$\sum_I \alpha_I T_I$$

We also have

$$T_i^{-1} = z\, T_i + q\, 1_H$$

$$\begin{aligned} S_n &\to H_n \\ \omega &\mapsto T_\omega \end{aligned}$$

$$\begin{aligned} H_n &\to \mathrm{EndMod}(R[S_n]) \\ T_i &\mapsto L_i \end{aligned}$$

Current note has 0 direct children and 0 total descendants.

- stretchy
  - Hecke algebras

And it has 62 siblings.

- stretchy
  - Trefoil 3_1 knot
  - The only compact connected Lie group that can act faithfully on a torus is itself
  - Hecke algebras
  - $\overline{B^n}$
  - $\mathrm{BS}(1,2)$
  - $(\mathbb{C}, +, \times)$
  - $D^* := D \setminus \{0\}$
  - Cantor set
  - Configuration space of N rigid points in $\mathbb{R}^3$
  - Free groups
  - $GL(2)(\mathbb{Z}) \curvearrowright T^2$
  - H_2^3
  - $[a,b]$
  - Figure 8 knot
  - Lamplighter group on $\mathbb{Z}_2$
  - $\beta\mathbb{N}$
  - $\#_2 \mathbb{R}P^2$
  - $\prod_{i\in\mathbb{N}} \{1, \ldots, n_i\}$
  - $\mathbb{R}P^n$
  - $(\mathbb{Q}, +, \times, <)$
  - $\mathbb{Q}_{\hat{p}}$
  - $\overline{\mathbb{Q}}$
  - $\mathbb{Q}_{\mathrm{constr}}$
  - $\mathbb{Q}(\xi_n)$
  - $\mathcal{O}_{\overline{\mathbb{Q}}}$
  - $(\mathbb{R}, +, \times, <, \sup)$
  - Homeomorphism of $\mathbb{R}^2$ that sends $\mathbb{N}$ to a countable closed discrete subset
  - $\mathbb{R}^2 \times S^1$
  - $\mathbb{R}^n$
  - $\mathbb{R} \times S^1$
  - $\mathbb{R} \times S^2$
  - S^1
  - $S^1 \wedge S^1$
  - $S^1 \times S^n$
  - S^2 and $\mathbb{C}\boldsymbol{P}^1$
  - Mapping torus of the antipodal map of S^2

- S^3
- S^n
- I-bundle
- Symmetric group
- $\mathbb{T}$
- T^2
- T_g^2
- $T_{0,0,3}^2$
- $\mathbb{R}^2 \setminus \{0\}$
- Three $T_{1,0,1}^2$ glued at their boundaries
- $T_{1,1,0}^2$
- T_2^2
- $T_g^2 \times [0,1]$
- $\#_{\mathbb{N}} T^2$
- Thompson's group
- T^n
- 3-valent tree
- 4-valent tree
- $[0,1]^{\mathbb{N}}$ with product topology
- Whitehead manifolds
- $\mathbb{Z}$
- $\mathbb{Z}[\sqrt{m}]$
- $\mathbb{Z}[X]$
- $\mathbb{Z}^{\mathbb{N}}$
- $\mathbb{Z}[i]$
- $\mathbb{Z}[i\sqrt{5}]$