Info

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The 3-sphere S^3

#wiki/Man/R/3

- toroidal coordinates

$$\begin{aligned} \mathbb{R}_{\geq 0} \times \mathbb{T}^2 &\to S^3 \\ (r, \theta_1, \theta_2) &\mapsto (re^{i\theta_1}, \sqrt{1-r^2}e^{i\theta_2}) \end{aligned}$$

- stereographic projection

$$\begin{aligned} S^3 \setminus \{(0,0,0,1)\} &\cong \mathbb{R}^3 \\ (x,y,z,w) &\mapsto (X,Y,Z) := \frac{1}{1-w}(x,y,z) \end{aligned}$$

  - $$(re^{i\theta_1}, 0) \mapsto (re^{i\theta_1}, 0)$$
  - stereographic projection in toroidal coordinates

$$(re^{i\theta_1}, \sqrt{1-r^2}e^{i\theta_2}) \mapsto \frac{1}{1-\sqrt{1-r^2}\sin\theta_2}(re^{i\theta_1}, \sqrt{1-r^2}\cos\theta_2)$$

- two D^3 glued at boundary S^3 as two solid 3-balls glued at boundary
- two solid torus $D^2 \times S^1$ glued at boundary S^3 as two solid tori glued at their boundaries
- $\pi_3(S^3) \cong \mathbb{Z}$ which is generated by the

Current note has 2 direct children and 2 total descendants.

- stretchy
  - S^3
    - S^3 as two solid 3-balls glued at boundary
    - S^3 as two solid tori glued at their boundaries

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 $\mathbb{Z}_2$
  - $\beta\mathbb{N}$
  - $\#_2\mathbb{R}P^2$
  - $\prod_{i\in\mathbb{N}}\{1,\ldots,n_i\}$
  - $\mathbb{R}P^n$
  - $(\mathbb{Q}, +, \times, <)$
  - $\mathbb{Q}_{\hat{p}}$
  - $\overline{\mathbb{Q}}$
  - $\mathbb{Q}_{\text{constr}}$
  - $\mathbb{Q}(\xi_n)$
  - $\mathcal{O}_{\overline{\mathbb{Q}}}$
  - $(\mathbb{R}, +, \times, <, \sup)$
  - 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 $\mathbb{C}P^1$
  - 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
- $\mathbb{Z}$
- $\mathbb{Z}[\sqrt{m}]$
- $\mathbb{Z}[X]$
- $\mathbb{Z}^{\mathbb{N}}$
- $\mathbb{Z}[i]$
- $\mathbb{Z}[i\sqrt{5}]$