

 Info

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Adjoint group of a Lie group

Definition. Adjoint group of a Lie group

The **Adjoint group** of a Lie group is the group

$$\frac{G}{\ker \text{Ad}} \hookrightarrow \text{Ad}(G)$$

for the Adjoint representation

$$\text{Ad} : G \rightarrow \text{AutLieAlg}_{\mathbb{P}}(\mathfrak{g}) \subset GL(\mathfrak{g})$$

for connected Lie groups

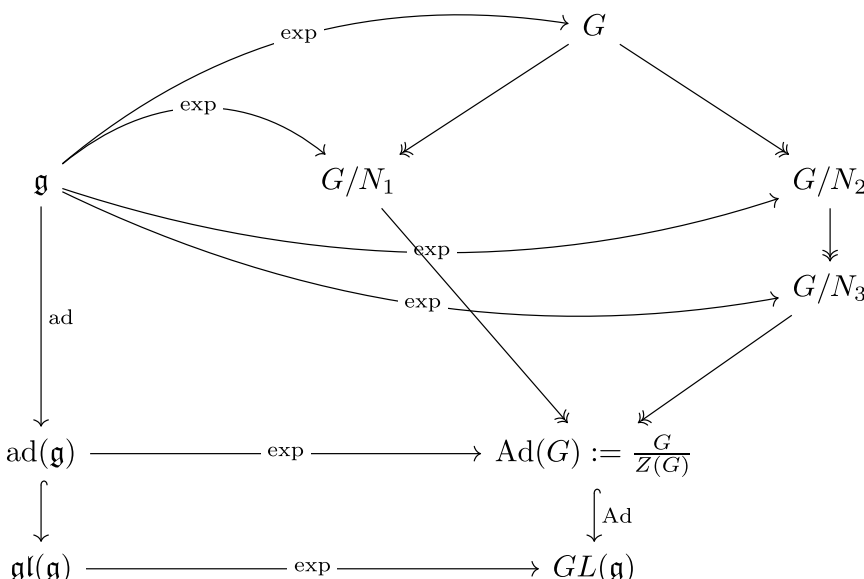
Proposition: Let G be a connected Lie group. Then $\ker \text{Ad} = Z(G)$ thus

$$\frac{G}{Z(G)} \hookrightarrow \mathrm{Ad}(G)$$

In particular,

- If a connected Lie group G has a trivial center, then the *adjoint representation* is a **faithful** representation of dimension $\dim G$

$$G \hookrightarrow \mathrm{Ad}(G) < GL(\mathfrak{g})$$



Current note has 0 direct children and 0 total descendants.

- structures based on sets
 - manifolds
 - $\mathbb{R}$ -manifold_group (Lie groups)
 - Adjoint representation of a Lie group
 - Adjoint group of a Lie group

And it has 2 siblings.

- structures based on sets
 - manifolds
 - $\mathbb{R}$ -manifold_group (Lie groups)
 - Adjoint representation of a Lie_group
 - Ad^* orbits are symplectic manifolds
 - Adjoint_group of a Lie_group