

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 August 15, 2023 6:38:31 PM, was last modified on September 7, 2026 2:34:29 PM, and was exported on September 7, 2026 2:50:38 PM.

$SO(2)(\mathbb{R})$

#wiki/Man/R/1

Definition.

$$\text{Rot}_2^\theta := (\cos \theta)I_2 + (\sin \theta) \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$$

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$$SO(2)(\mathbb{R}) := \{A \in \text{Mat}_{\mathbb{R}}(2) : AA^\top = I_2\}$$

By

Definition.

$$SO(2)(\mathbb{R}) := \{A \in \text{Mat}_{\mathbb{R}}(2) : AA^\top = I_2\}$$

$$SO(2)(\mathbb{R}) = \{\text{Rot}_2^\theta : \theta \in [0, 2\pi)\}$$

where

Definition.

$$\text{Rot}_2^\theta := (\cos \theta)I_2 + (\sin \theta) \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$$

Lie algebra

$$\begin{aligned} \exp : \mathfrak{so}(2, \mathbb{R}) &\rightarrow SO(2)(\mathbb{R}) \\ \theta \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix} &\mapsto \exp(\theta \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}) \\ &= (\cos \theta)I_2 + (\sin \theta) \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix} \end{aligned}$$

Current note has 1 direct children and 1 total descendants.

- squishy
 - SO
 - SO(2)(R)
 - so(2, R)

And it has 5 siblings.

- squishy
 - SO
 - SO(x^2 + y^2 - sqrt(2)z^2)(Z[sqrt(2)])
 - SO(2)(R)
 - SO+(2, 2)(R)
 - SO(3, R)
 - SO(4, R)