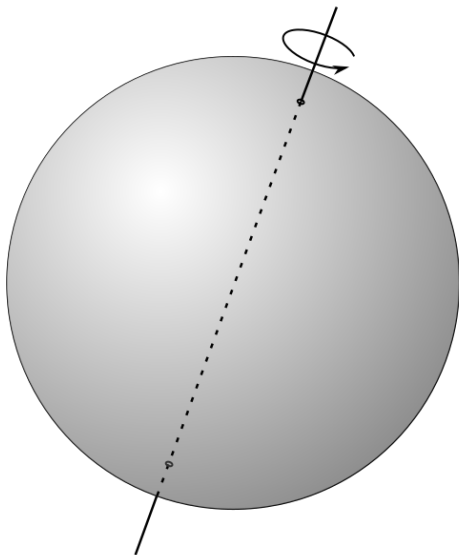


Matrix Groups

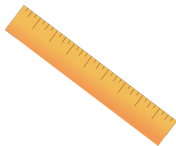
Hernan Ibarra

Supervisors : Rosie Shewell Brockway &
Karoline van Gemst

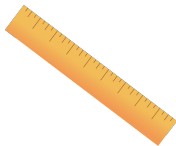


Rotation about an axis

$$(x, y, z) \xrightarrow{f} (x', y', z')$$



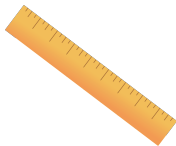
Isometry



Isometry



Fixes the origin



Isometry

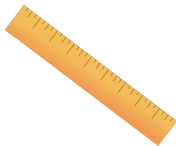


Fixes the origin



Created by brnjinleff
from Noun Project

Preserves orientation



Isometry

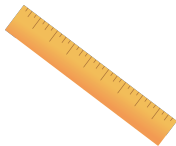


Fixes the origin



Created by brinjaleff
from Noun Project

Preserves orientation



Isometry

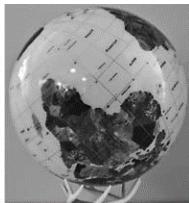


Fixes the origin



Created by brinjaleff
from Noun Project

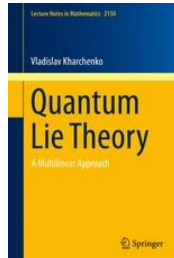
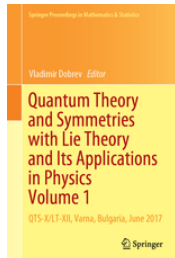
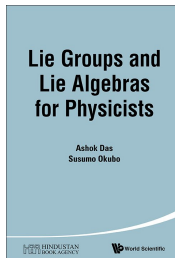
Preserves orientation

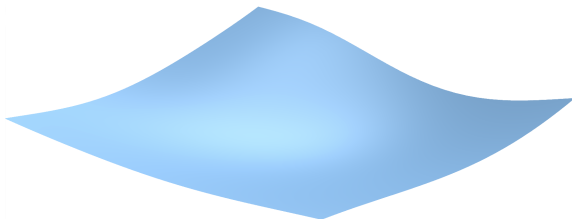


$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

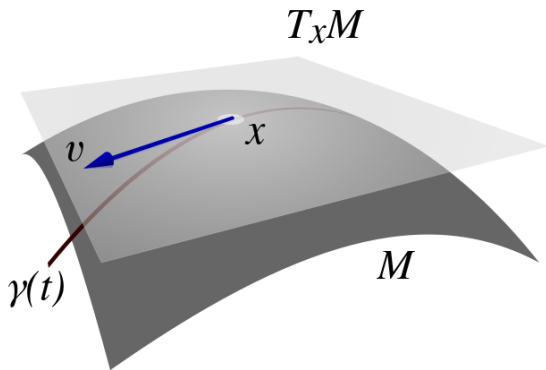
$$\begin{pmatrix} a & b & c \\ d & e & f \\ g & h & i \end{pmatrix}$$

$$\begin{pmatrix} x & y & z \\ u & v & w \\ r & s & t \end{pmatrix}$$





A manifold



A tangent space

References

1. File:Ball with d r and o marked.svg: Masur derivative work: Quartl, CC BY-SA 4.0
<https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons
2. Tapp, K. (2016) Matrix Groups for Undergraduates. Providence: American Mathematical Society.