

Naive Lie Theory 1.4 Exercises

OblivionIsTheName

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1.4.1

Direct calculation.

1.4.2

Nothing different from proving this with three real vectors. More vector calculation.

1.4.3

Using 1.4.1 and then 1.4.2, we have

$$(u \times v) \times w = -w \times (u \times v) = v(w \cdot u) - u(w \cdot v)$$

which is not equal the expression of $u \times (v \times w)$ we got in 1.4.2.

1.4.4

Given the fact that inner product is commutative here (as if the inner product here is no more than the one for 3D real vectors), one can expand the three terms using result from 1.4.2 and cancel everything.