

group theory - week 10

$O(2)$ symmetry sliced

Georgia Tech PHYS-7143

Homework HW10

due Tuesday, March 29, 2016

== show all your work for maximum credit,
== put labels, title, legends on any graphs
== acknowledge study group member, if collective effort
== if you are LaTeXing, here is the [source code](#)

Exercise **10.1** *Commutators*

?? points

Bonus points

Exercise **2.5** ?? *for large arguments*

?? points

Total of ?? points = 100 % score. Extra points accumulate, can help you later if you miss a few problems.

2016-03-15 Predrag Lecture 19 Lie groups, algebras Bridging the step from discrete to continuous compact groups: $SO(2)$ invariant integration measure, orthonormality, and completeness relations.

Reading: C. K. Wong *Group Theory* notes, [Chap 6 1D continuous groups](#), Sect. 6.4.

Reading: Chen, Ping and Wang [\[1\]](#) *Group Representation Theory for Physicists*, [Sect 5.3 Lie algebras](#) and [Sect 5.4 Finite transformations](#).

2016-03-17 Predrag Lecture 20 $O(2)$ symmetry sliced

Reading: Chen, Ping and Wang [\[1\]](#) Sects 5.5, 5.6 and 5.7

References

- [1] J.-Q. Chen, J. Ping, and F. Wang, *Group Representation Theory for Physicists* (World Scientific, Singapore, 1989).

Exercises

- 10.1. **Commutators.** Derive the Lie algebra commutator and the Jacobi identity as particular examples of the invariance condition on invariant tensor, using both index and birdtracks notations.