Questions for Assignment 2

MAST90017 Representation Theory
Semester II 2015
Lecturer: Arun Ram
to be turned in on 13 August 2015 before 5pm

(1) What are the favourite presentations for the symmetric group S_n? Provide proofs.

(2) What are the favourite presentations for the Lie algebra $\mathfrak{gl}_n$? Provide proofs.

(3) What are the favourite presentations for the Lie algebra $\mathfrak{sl}_n$? Provide proofs.

(4) What are the favourite presentations for the Lie algebra $\mathfrak{su}_2$? Provide proofs.

(5) What are the favourite presentations for the Lie algebra $\mathfrak{so}_n$? Provide proofs.

(6) What are the favourite presentations for the Lie algebra $\mathfrak{sp}_n$? Provide proofs.

(7) What are the favourite presentations for the dihedral groups? Provide proofs.

(8) What are the favourite presentations for the groups $G_{r,1,n}$? Provide proofs.

(9) What are the favourite presentations for the groups $G_{r,d,n}$ with $d \neq 1$? Provide proofs.

(10) What are the favourite presentations of the tetrahedral, octahedral and icosahedral groups? Provide proofs.

(11) What are the favourite presentations of the finite subgroups of $SO_3(\mathbb{R})$? Provide proofs.

(12) What are the favourite presentations of the finite subgroups of $SU_2(\mathbb{C})$? Provide proofs.

(13) What are the favourite presentations of the group $PGL_2(\mathbb{C})$? Provide proofs.

(14) What are the favourite presentations of the group $SL_2(\mathbb{Z})$? Provide proofs.

(15) What are the favourite presentations of the group $SL_n(\mathbb{C})$? Provide proofs.

(16) What are the favourite presentations of the group $O_n(\mathbb{C})$? Provide proofs.

(17) What are the favourite presentations of the group $SO_n(\mathbb{C})$? Provide proofs.

(18) What are the favourite presentations of the group $Sp_n(\mathbb{C})$? Provide proofs.

(19) What are the favourite presentations of the group $U_n(\mathbb{C})$? Provide proofs.

(20) What are the favourite presentations of the group $SU_n(\mathbb{C})$? Provide proofs.