

The in-class midterm will consist of easy computations, statements of definitions, and straightforward proofs. The idea is to encourage you to go back and review all the things we've learned up to now. I've listed some study ideas below. Not everything on the exam is necessarily on this list

- What is a group? A subgroup? A group homomorphism?
- What is a normal subgroup of a group? What is the quotient group G/N when N is a normal subgroup of G ? What is a simple group?
- Name a theorem that relates reflections and isometries that preserve the origin in \mathbb{R}^n .
- How do you represent rotations in \mathbb{R}^4 and \mathbb{R}^3 using quaternions?
- What is the relationship between $SU(2)$ and $SO(4)$? What is the relationship between $SU(2)$ and $SO(3)$? You should know the details here.
- How do you represent complex numbers as matrices? Quaternions?
- Why is multiplication by a unit quaternion an isometry?
- How are the groups $O(n)$, $SO(n)$, $U(n)$, $SU(n)$, and $Sp(n)$ defined? What is the common theme connecting these?
- How do you represent reflections using quaternions?