The in-class midterm will consist of easy computations, statements of definitions, and straight-forward 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 homomorphisim?

- 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 knoow the details here.

- How do you represent complex numbers as matrics? Quaternions?

- Why is multiplication by a unit quaterinion 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 represent reflections using quaternions?

- What does it mean for a matrix group to be path connected? Why is $O(n)$ not path connected?

- What is a maximal torus? What is the center of a group? What are the centers of the groups $O(n)$, $SO(n)$, $U(n)$, $SU(n)$, and $Sp(n)$? Why is the center a normal subgroup?