Problem 01

Let G be a group, s.t. $\forall g \in G$, $g^2 = e$. Show that G is abelian.

Problem 02

Prove the following theorem: A subset H of a group G is a subgroup if and only if $e \in H$ and $h_1, h_2 \in H$ imply $h_1 h_2^{-1} \in H$.

Problem 03

Show that a general element $g \in SU(2)$ is of the form

$$g = \begin{pmatrix} z & -\omega^* \\ \omega & z^* \end{pmatrix}$$

with $(z, \omega) \in \mathbb{C}$ and $|z|^2 + |\omega|^2 = 1$.