Problem 1.

Let $K \subset \mathbb{C}$ be a compact set. Prove that $u(z) = -\log(\text{dist}(z, K))$ is a subharmonic function in $\mathbb{C} \setminus K$.

Problem 2.

Let $h(z)$ be a $C^2$ function in a neighborhood of the closed unit disc. Prove that inside the unit disc $h$ can be represented as a difference of two subharmonic functions.