# MATH 2250, Fall 2010.
# Homework assignment, Nov. 8, 2010

1. Let $\varphi$ be a continuous compactly supported function in $\mathbb{C}$, and let

$$u(z) = \frac{1}{2\pi} \iint_{\mathbb{C}} \varphi(\xi) \ln|\xi - z| dA(\xi).$$

Show (using one of the Green's formulas) that $\Delta u = \varphi$.

2. Let $u$ be a bounded harmonic function in $\mathbb{D} \setminus \{0\}$. Show that 0 is a removable singularity of $u$, meaning that $\lim_{z \to 0} u(z)$ exists, and if we define $u(0)$ to be this limit, he resulting function will be harmonic in the whole disc $\mathbb{D}$.