

Let $D \subseteq \mathbb{C}$ be an open set containing the closed unit disk $\{z : |z| \leq 1\}$. Let $f : D \rightarrow \mathbb{C}$ be a holomorphic function, and let $p(z)$ be a monic polynomial. Prove that

$$|f(0)| \leq \max_{|z|=1} |f(z)p(z)|.$$