

COMPLEX ANALYSIS, HW # 2

Section 10, problems 2, 3, 4, 8, 17, 18, and this problem:

Problem 1.

Let $f(z)$ be analytic and satisfy $|f(z)| \leq 100z^{-2}$ in the strip $\alpha_1 \leq \operatorname{Re} z \leq \alpha_2$. Prove that the function

$$h(x) = \int_{-\infty}^{+\infty} f(x + iy)dy$$

is a constant function of $x \in [\alpha_1, \alpha_2]$.