

Math 418

Homework 9

Due April 10,2001

C17. Find the general form of homogeneous polynomials of order 2

$$P(x, y) = ax^2 + bxy + cy^2$$

which are harmonic functions. Represent them as the real part of analytic functions.

C18. Evaluate

$$\int_0^{2\pi} (1 - |z|^2) |z - e^{i\theta}|^{-2} \cos \theta \, d\theta$$

for $|z| < 1$.

Hint. Use the Poisson integral and the relation $\cos \theta = \operatorname{Re}(e^{i\theta})$.
Problems 5 and 7, Chapter 5, Section 1 (Levinson and Redheffer).
Read Chapter 5, Sections 3, 1 and 2 .