*Kragujevac J. Math.* 24 (2002) 123–133.

# THE CLAIRAUT AND LAGRANGE AREOLAR EQUATION

**Miloje Rajović[a] and Dragan Dimitrovski[b]**

[a] *University of Kragujevac, Faculty of Mechanical Engineering in Kraljevo, 36000 Kraljevo, Yugoslavia*
[b] *University of Skopje, Faculty of Natural Sciences and Mathematics, Institute of Mathematics, 91000 Skopje, Macedonia*

*(Received March 4, 2002)*

**Abstract.** The method of differentiation and the Clairaut and Lagrange equations have not been considered for areolar equations, and thus the same is with the theory of singular integrals and singular points. A reason for this is that the areolar derivative $\frac{\partial W}{\partial \overline{z}}$ has not arithmetic properties of the usual quotient $\frac{df(z)}{dz}$ for analytic functions. In this paper we will try to solve equations with singular integrals for areolar equations and to begin qualitative and geometric theory.

## 1. PARTIAL AREOLAR DIFFERENTIAL

Areolar and generalized derivatives

$$\frac{\partial w}{\partial \overline{z}} \quad \text{and} \quad \frac{\partial w}{\partial z} \tag{1}$$

for complex functions of two independent variables do not have arithmetic properties of the usual quotient, which the derivative of an analytic function has:

$$\frac{df(z)}{dz} = f'(z),\ df = f'(z)dz,\ dz = \frac{df}{f'(z)},\ \frac{dz}{df} = \frac{1}{f'(z)}. \tag{2}$$