

Farit G. Avkhadiev and Karl-Joachim Wirths

**Estimates of the Derivatives of Meromorphic Maps
from Convex Domains into Concave Domains**

CMFT 8 No.1 (2008), 107–119. [ISSN 1617-9447]

Abstract. Let Ω be a proper convex subdomain of the complex plane \mathbb{C} . Let further $\Pi_1 \subset \mathbb{C}$ be a compact convex set containing more than one point and $\Pi = \overline{\mathbb{C}} \setminus \Pi_1$. We denote by $R_\Omega(z)$ and $R_\Pi(w)$ the conformal radius of Ω at z and of Π at finite points w , respectively. We are concerned with the set $A(\Omega, \Pi)$ of functions $f: \Omega \rightarrow \Pi$ meromorphic on Ω . We prove that for $n \geq 2$, $f \in A(\Omega, \Pi)$, $z \in \Omega$ and $f(z)$ finite the inequalities

$$\frac{|f^{(n)}(z)|}{n!} \frac{(R_\Omega(z))^n}{R_\Pi(f(z))} \leq \frac{(1+p)^{n-2}}{p^{n-1}} \sum_{k=0}^n p^k$$

are valid, where p is a measure for the distance between $f(z)$ and the point at infinity.

We give examples showing that equality is possible in this estimate.

Keywords. Convex domain, concave domain, n th derivative, conformal radius, subordination.

2000 MSC. 30C80, 30C55, 30C20.

Received. October 23, 2006, in revised form December 13, 2007, and February 12, 2007.

Published online. May 22, 2007.