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HOROCYCLIC CLUSTER SETS OF FUNCTIONS DEFINED IN THE UNIT DISC

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1. Introduction.

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Unless otherwise stated, $f: D \to W$ shall mean $f(z)$ is an arbitrary single-valued function defined in the open unit disc D: $|z| < 1$ and assuming values in the extended complex plane W. The unit circle $|z| = 1$ is denoted by Γ.

We assume the reader to be familiar with the rudiments of the theory of cluster sets. A general reference would be Noshiro [21] or Collingwood and Lohwater [9]. We shall use the following sets defined in [9, p. 207]:

$C(f, \zeta)$, the cluster set of f at ζ;

$C_{\mathscr{A}}(f, \zeta)$, the outer angular cluster set of f at ζ;

$C_{\Delta}(f, \zeta)$, the cluster set of f at ζ on a Stolz angle Δ at ζ;

$F(f)$, the set of Fatou points of f;

$I(f)$, the set of Plessner points of f;

$M(f)$, the set of Meier points of f;

$R(f, \zeta)$, the range of f at ζ.

We denote the cluster set of f at ζ on a chord χ at ζ by $C_{\chi}(f, \zeta)$. The principal chordal cluster set of f at ζ is defined to be

$$\Pi_{\chi}(f, \zeta) = \bigcap_{\chi} C_{\chi}(f, \zeta),$$

where the intersection is taken over all chords χ at ζ; and the inner angular cluster set of f at ζ is defined to be

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