

Some characteristic properties of analytic functions

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We consider a class $\mathcal{L}(\lambda, \mu; \phi)$ of analytic functions f defined in the open unit disk \mathbb{U} satisfying the subordination condition that

$$q(z) \frac{\mathcal{D}^{\lambda+1} f(z)}{\mathcal{D}^{\lambda} f(z)} \prec \phi(z) \quad (\lambda \in \mathbb{N}_0, \mu \geq 0; z \in \mathbb{U}),$$

where $q(z) = \left(\frac{z}{\mathcal{D}^{\lambda} f(z)}\right)^{\mu-2}$, \mathcal{D}^{λ} is the Sălăgean operator and $\phi(z)$ is a convex function with positive real part in \mathbb{U} . We obtain some characteristic properties giving the coefficient inequality, radius and subordination results, and an inclusion result for the above class when the function $\phi(z)$ is a bilinear mapping in the open unit disk. For these functions $f(z)$, sharp bounds for the initial coefficient and for the Fekete-Szegő functional are determined, and also some integral representations are given.

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