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Some Special Subclasses of Carathéodory's or Starlike Functions and Related Coefficient Problems

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Abstract: Let \mathcal{P} be the class of analytic functions in the unit disk $U = \{ |z| < 1 \}$ with $p(0) = 0$ and $\Re p(z) > 0$ in U . Let also \mathcal{S}^* , \mathcal{K} be the well known classes of normalized univalent starlike and convex functions respectively. For $\Re \alpha > 0$ we introduce the classes $\mathcal{P}_{[\alpha]}$, $\mathcal{S}_{[\alpha]}^*$ and $\mathcal{K}_{[\alpha]}$ which are subclasses of \mathcal{P} , \mathcal{S}^* and \mathcal{K} respectively, being defined as follows: $p \in \mathcal{P}_{[\alpha]}$ iff $p \in \mathcal{P}$ with $p(z) \neq \alpha \forall z \in U$, $f \in \mathcal{S}_{[\alpha]}^*$ iff $\frac{zf'}{f} \in \mathcal{P}_{[\alpha]}$ and $f \in \mathcal{K}_{[\alpha]}$ iff $1 + \frac{zf''(z)}{f'(z)} \in \mathcal{P}_{[\alpha]}$. In this paper we study different kind of coefficient problems for the above mentioned classes $\mathcal{P}_{[\alpha]}$, $\mathcal{S}_{[\alpha]}^*$ and $\mathcal{K}_{[\alpha]}$. All the estimations obtained are the best possible.

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