# The Fekete-Szegö Theorem for Certain Class of Analytic Functions [1]

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### Abstract

In this paper we discuss a well-known class studied by Ramesha [12] and later by several authors ( see [8, 1, 7]). Next we extend the class to a wider class of functions $f$ denoted by $u_{\alpha,\beta}^{\gamma}$, which are normalised and univalent, in the open unit disc $D = \{ z \in \mathbb{C} : |z| < 1 \}$ satisfying the condition

$$\mathrm{Re}\left( \frac{\alpha z^2 f''(z)}{g(z)} + \frac{zf'(z)}{g(z)} \right) > \beta, \quad 0 \leq \alpha < 1 \text{ and } 0 \leq \beta < 1,$$

where $g \in S^*(\gamma)$, $g(z) \neq 0$ and $0 \leq \gamma < 1$, is a normalised starlike function of order $\gamma$. For $f \in u_{\alpha,\beta}^{\gamma}$ we shall obtain sharp bounds for the Fekete-Szegö functional $\left| a_3 - \mu\, a_2^2 \right|$ when $\mu$ is real.

# References

[1] M. Darus, A. Akbarally, *Fekete-Szegö functional for certain subclass of analytic functions*, J. Inst. Math. Comp. Sci. (Math Ser.), 15(2), 2002, 109-113.

[2] M. Darus, D. K. Thomas, *On the Fekete-Szegö theorem for close-to-convex functions*, Math. Japonica, 44(3), 1996, 507-511.

[3] M. Darus, D. K. Thomas, *On the Fekete-Szegö theorem for close-to-convex functions*, Math. Japonica, 47(1), 1998, 125-132.

[4] M. Darus, D. K. Thomas, *The Fekete-Szegö theorem for strongly close-to-convex functions*, Scientiae Mathematicae, 3(2), 2000, 201-212.

[5] M. Fekete, G. Szegö, *Eine bermerkung über ungerade schlichte funktionen*, J. Lond. Math. Soc., 8, 1933, 85-89.

[6] B. A Frasin, M. Darus, *On the Fekete- Szegö using the Hadamard product*, Inter. Math. J., 3(12), 2003, 1297-1304.

[7] A. Janteng, *Assortment of problems for certain classes of analytic functions*, Phd thesis, University of Malaya, K. L. Malaysia, 2006.

[8] A. Janteng, M. Darus, *Coefficient problems for certain subclass of analytic functions*, J. Inst. Math. Comp. Sci. (Math Ser.), 13(1), 2000, 91-96.

[9] F. R Keogh, E. P. Merkes, *A coefficient inequality for certain classes of analytic functions*, Proc. Amer. Math. Soc., 20, 1969, 8-12.

[10] W. Koepf, *On the Fekete-Szegö problem for close-to-convex functions*, Proc. Amer. Math. Soc., 101, 1987, 89-95.

[11] Ch. Pommerenke, *Univalent functions*, Vandenhoeck and Ruprecht, Göttingen, 1975.

[12] C. Ramesha, S. Kumar, K.S. Padmanabhan, *A sufficient condition for starlikeness*, Chinese J. Math., 23, 1995, 167-171.

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