

SUFFICIENT CONDITIONS OF STARLIKENESS AND CONVEXITY FOR FUNCTIONS OF COMPLEX ORDER

(Syarat Cukup bagi Kebakbintangan dan Kecembungan untuk Fungsi Peringkat Kompleks)

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ABSTRACT

Let A be the class of normalised and analytic functions defined in the unit disc $U = \{z : |z| < 1\}$.

In this paper we study the expression $\frac{zf'(z)}{b[f(z)]^2} - (1+\gamma)\frac{z}{bf(z)} + \gamma$, $z \in U$, for some $\gamma (\gamma > 0)$ and

$b (b \in \mathbb{C} \setminus \{0\})$ as a criteria for starlikeness and convexity at analytic functions of complex order.

Keywords: starlikeness; convexity; analytic functions; sufficient conditions

ABSTRAK

Andaikan A kelas fungsi ternormalkan dan analisis yang ditakrifkan dalam cakera unit

$U = \{z : |z| < 1\}$. Dalam makalah ini dikaji tentang ungkapan $\frac{zf'(z)}{b[f(z)]^2} - (1+\gamma)\frac{z}{bf(z)} + \gamma$,

$z \in U$, untuk setiap $\gamma (\gamma > 0)$ dan $b (b \in \mathbb{C} \setminus \{0\})$ sebagai suatu kriterium bagi kebakbintangan dan kecembungan untuk fungsi analisis peringkat kompleks.

Kata kunci: kebakbintangan; kecembungan; fungsi analisis; syarat cukup

References

- Bulboacă T. & Tuneski N. 2001. New criteria for starlikeness and strongly starlikeness. *Matematica (Cluj)* **43**(66): 11–22.
- Duren P. L. 1983. *Univalent Functions*. New-York: Springer-Verlag.
- Mocanu P. T. 1988. Some starlikeness conditions for analytic functions. *Rev. Roumaine Math. Pures Appl.* **33**: 117–124.
- Miller S. S., Mocanu P. T. & Reade M. O. 1984. Subordination preserving integral Operators. *Trans. Amer. Math. Soc.* **283**: 605–615
- Mocanu P. T. 1992. Two Simple conditions for starlikeness. *Matematica (Cluj)* **34**(57): 175–181.
- Mohamad Pauzi M. N. & Darus M. 2017. Generalised class of starlike functions of Koebe type. *Journal of Quality Measurement and Analysis* **13**(1): 1–13.
- Nasr M. A. & Aouf M. K. 1982. On convex functions of complex order. *Mansoura Sci. Bull. Egypt* **9**: 565–582.
- Nasr M. A. & Aouf M. K. 1985. Starlike functions of complex order. *J. Natur. Sci. Math.* **25**: 1–12.
- Nishiwaki J. & Owa S. 2014. New sufficient conditions for starlike and convex functions. *TWMS J. App. Eng. Math.* **4**(1): 74–79.
- Nunokawa M. & Sokol J. 2015. On starlikeness of Libera transform. *Sains Malaysiana* **44**(1): 155–158.
- Obradovic M. 1997. Simple Sufficient for Starlikeness. *Mat. Vesnik* **49**: 241–244.
- Ramesha C., Kumar S. & Padmanabhan K. S. 1995. A sufficient conditions for starlikeness. *Chinese J. Math.* **23**(2): 167–171.
- Silverman H. 1999. Convex and starlike criteria. *Int. J. Math. Math. Sci.* **22**(1): 75–79.
- Singh V. & Tuneski N. 2004. On a criteria for starlikeness and convexity of analytic. *Acta Math. Sci.* **24**(B4): 597–602.
- Siregar S. 2011. The starlikeness of analytic functions of Koebe type. *Mathematical and Computer Modelling* **54**: 2928–2938.
- Siregar S. & Darus M. 2011. Certain condition for starlikeness of analytic functions of Koebe type. *International Journal of Mathematics and Mathematical Sciences*, 1–12, doi:10.1155/2011.

- Siregar S. & Akbararally A. 2014. Certain conditions for starlikeness of Φ -like functions of Koebe type. *AIP Conference Proceeding* 1605(1): 596-600.
- Tuneski N. 2009. Some simple condition for starlikeness and convexity. *Appl. Math. Letter.* **22**(5): 693–697.
- Wiatrowski P. 1970. On the coefficients of some family of holomorphic functions. *RZeszyty Nauk. Uniw. Lodz Nauk. Mat-Przyrod* **8**(2): 75-85.

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