İSTANBUL ANALYSIS SEMINARS

CROSS RATIO PROBLEM ON SOME SUBCLASSES OF UNIVALENT FUNCTIONS

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Abstract: Let D be a simply connected domain in the closed complex plane $\mathbb{C}$. For given distinct poins $z_k\,(k = 1, ..., 4)$ in D, let (z_1, z_2, z_3, z_4) denote their cross ratio. It is well-known that if $w = h(z)$ is a Möbius transformation and $w_k = h(z_k)$, then $(z_1, z_2, z_3, z_4) = (w_1, w_2, w_3, w_4)$ but it may not be so if h is an arbitrary univalent function in D. If $w = f(z)$ is univalent in D, then the quotient $(w_1, w_2, w_3, w_4)/(z_1, z_2, z_3, z_4)$, denoted by $Q(f)$, determines a ***measure of deviation*** of f from a Möbius transformation. So there arises the problem of finding the variability region of $Q(f)$ when f belongs to a class of univalent functions which is compact in the space $H(D)$ of holomorphic functions in D.

In this talk we will point out a couple of results in this direction and give a concrete result for a small class "univalent second degree polynomials."

References

[1] Y. Avcı, "Univalent rational functions on the unit disc," *İstanbul Üniv. Fen Fak. Mecm. Ser. A* **44** (1979), 83–88 (1983).

[2] Y. Avcı & E. Złotkiewicz, "An extremal problem for univalent functions," *İstanbul Üniv. Fen Fak. Mat. Derg.* **50** (1991), 159–164 (1993).

[3] Y. Avcı & E. Złotkiewicz, "A few remarks on convex mappings," *Math. Balkanica (N.S.)* **13** (1999), no. 1-2, 47–54.

[4] James A. Jenkins, "The method of the extremal metric," in: *Handbook of Complex Analysis: Geometric Function Theory, Vol. 1*, R. Kühnau (ed.), pp. 393–456. Elsevier Science B.V., North-Holland, Amsterdam, 2002.

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