

On some semigroups on the complex plane

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The sets $C(\alpha) = \{z \in \mathbb{C} : |z \sin \alpha \pm i \cos \alpha| \leq 1\}$, where $\alpha \in (0, \pi/2)$ form multiplicative semigroups on the complex plane \mathbb{C} [1]. The following theorem is the main result of the talk.

Theorem. *Semigroups $C(\alpha)$ and $C(\beta)$ are not isomorphic when $\alpha \neq \beta$ and the unique automorphisms of the semigroup $C(\alpha)$ are the mappings $\Phi(z) = z$ and $\Phi(z) = \bar{z}$.*

All continuous semicharacters of the semigroups $C(\alpha)$ and all continuous automorphisms of the closed unit disk are described. Other examples of semigroups are obtained by transformations of $C(\alpha)$.

References

- [1] Arlinskiĭ, Yu.M., *A class of contractions in Hilbert space*, Ukrain. Mat. Zh. 39 (1987), no. 6, 691–696, (Russian).