SOME COMBINATORIAL PROPERTIES
OF HAMEL'S MONO-UNARY ALGEBRAS

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Definition: The mono-unary algebra (R, f) is called Hamel's mono-unary algebra, if $f : R \to R$ is a nontrivial solution of the Cauchy functional equation, constructed by Hamel [1].

We give the characterization of the connected components of Hamel's mono-unary algebras.

Theorem 1. The following equality holds $\left| Aut(R, f) \right| = 2^{\uparrow}(2^{\uparrow}((\downarrow 0))$.

Theorem 2. There are only 3 pairwise nonisomorphic Hamel's mono-unary algebras.

References

[1]   Hamel G. Eine basis aller Zahlen und die unstetigen Lösungen der Functional gleichung $f(x + y) = f(x) + f(y)$ Math. Ann.60 (1908), 459-462