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COMMENTATIONES MATHEMATICAE UNIVERSITATIS CAROLINAE

# SPACES WHICH ADMIT NEGATIVE POWERS AND ALL ROOTS

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(Preliminary communication)

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Let $(\mathcal{S}, +)$ be a commutative semigroup, $\mathcal{K}$ be a category with products. A mapping $\varkappa : \mathcal{S} \longrightarrow obj\, \mathcal{K}$ is called a representation of the semigroup $(\mathcal{S}, +)$ by products in $\mathcal{K}$ whenever

(i) if $s, t \in \mathcal{S}$, $s \neq t$, then $\varkappa(s)$ is not isomorphic to $\varkappa(t)$

(ii) if $s, t \in \mathcal{S}$, then $\varkappa(s+t)$ is isomorphic to $\varkappa(s) \times \varkappa(t)$.

Each semigroup with one generator and each Abelian group have representations in the categories of topological (or proximity or uniform) spaces, graphs, small categories, unary algebras with at least two operations and some others. If the represented group is countable, then the objects $\varkappa(s)$ have some further properties, for example the spaces can be chosen locally compact and metrizable.

Taking the additive group of all rational numbers as the represented semigroups, we obtain a space (or a graph or an algebra) which has "negative powers" and "all roots". The full version with all proofs will appear in J. of Algebra under the title "Representation of semigroups by products in a category".

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