

1056-22-311

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Homomorphisms on compact subsets of βS .

Let S and T be infinite discrete semigroups, let $\mathcal{A} \subseteq \mathcal{P}(S)$, and assume that \mathcal{A} has the finite intersection property. Let $f : S \rightarrow T$ and let $\tilde{f} : \beta S \rightarrow \beta T$ be its continuous extension. We obtain necessary and sufficient conditions for the restriction of \tilde{f} to $\bigcap_{A \in \mathcal{A}} \text{cl}_{\beta S}(A)$ to be a homomorphism and to be injective. We also investigate when the image of an idempotent must be an idempotent. (Received August 27, 2009)