

Title	A NATURAL PARTIAL ORDER AND SANDWICH SETS ON REGULAR Γ -SEMIGROUPS
Author	Napaporn Chunse
Advisor	Associate Professor Manoj Siripitukdet, Ph.D.
Co-Advisor	Assistant Professor Chaiwat Namnak, Ph.D. Suphawan Janphaisaeng, Ph.D.
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ABSTRACT

In this research, we firstly introduce and investigate some interesting properties of the natural partial order on regular Γ -semigroups and partial orders on the set of all idempotents of Γ -semigroups. Secondly, we determine when the partial orders are compatible with respect to the multiplication and find the least primitive congruence on a regular Γ -semigroup. Thirdly, we construct (α, β, θ) -sandwich set in regular Γ -semigroups, denoted by $S_{\theta}^{(\alpha, \beta)}(e, f)$ where $\theta \in \Gamma$, e is α -idempotent and f is β -idempotent and study two mappings between $S_{\theta}^{(\alpha, \beta)}(e, f)$ and $S_{\theta}^{(\alpha, \beta)}(e, f)\theta f \times e\theta S_{\theta}^{(\alpha, \beta)}(e, f)$ are mutually inverse θ -isomorphisms. Finally, we study the properties of homomorphisms of regular Γ -semigroups that they preserve and reflect natural partial orders and we find a simple description of the finest completely simple congruence on a regular Γ -semigroup.