

On Certain Relations Between Strong Reducibilities and Classes of Simple Sets

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The thesis addresses a fundamental issue in computability theory: establishing connections between algorithmic reducibilities and the structural properties of recursively enumerable sets. The work analyzes the role of combinatorial requirements within the context of Post's problem and demonstrates how variations in reducibility conditions necessitate the introduction of new structural classes, namely simple, hypersimple, and hyperhypersimple sets. Along with the systematization of theoretical models, several new dependencies are established between basic sets and families of equivalence relations constructed upon them in the context of strong computability reducibilities.

The obtained results allow for a deeper understanding of the nature of non-recursive structures, reveal their algorithmic properties with respect to strong reducibilities, and extend the apparatus of the theory of recursively enumerable equivalence relations.