

Abstract

This monograph presents a unified framework for determining the congruences on a number of monoids and categories of transformations, diagrams, matrices and braids, and on all their ideals. The key theoretical advances present an iterative process of stacking certain normal subgroup lattices on top of each other to successively build congruence lattices of a chain of ideals. This is applied to several specific categories of: transformations; order/orientation preserving/reversing transformations; partitions; planar/annular partitions; Brauer, Temperley–Lieb and Jones partitions; linear and projective linear transformations; and partial braids. Special considerations are needed for certain small ideals, and technically more intricate theoretical underpinnings for the linear and partial braid categories.