Factroids. A new algebraic structure within rings and modules

Neil Epstein, George Mason University, Fairfax, VA – 22030

Abstract

Let T be a subset of a ring A, and let M be an A-module. We study the additive subgroups F of M such that, for all $x \in M$, if $tx \in F$ for some $t \in T$, then $x \in F$. We call any such subset F of M a *T-factroid of M*, which is a kind of dual to the notion of a T-submodule of M. We connect the notion with the zero-divisors on M and the recent concepts of unit-additive commutative rings (which in turn generalize the fundamental theorem of algebra) and of Egyptian fractions with respect to a multiplicative subset of a commutative ring (a new application of an ancient idea). We also introduce a common generalization of local rings and unit-additive rings, called *sublocalizing* rings, and relate them to T-factroids. – This is joint work with Jesse Elliott.

Keywords: factroid, local ring, unit-additive ring.