

Free Cyclic Submodules and Non-Unimodular Vectors

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Given a finite associative ring with unity, R , and its two-dimensional left module, R^2 , the following two problems are addressed: 1) the existence of vectors of R^2 that do not belong to any free cyclic submodule (FCS) generated by a unimodular vector and 2) conditions under which such (non-unimodular) vectors generate FCSs. The main result is that for a non-unimodular vector to generate an FCS of R^2 , R must have at least two maximal right ideals of which at least one is non-principal.

Comments: 8 pages, no figures; V2 - some theorems slightly reworked, text polished and a reference added

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