

The Gabriel-Popescu Theorem

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Abstract

In this lecture we will give an brief overview of Grothendieck categories and of localization of abelian categories by a Serre subcategory, we will also state the famous Gabriel-Popescu Theorem which allows to characterize Grothendieck categories as localization categories of a module category over some ring R . We will sketch three different proofs of this result, the original one by Gabriel and Popesco and two short proofs, one by Takeuchi and another one by Mitchell.

References

- [Mit81] Barry Mitchell. A quick proof of the gabriel-popesco theorem. *Journal of Pure and Applied Algebra*, 20(3):313–315, 1981.
- [PG64] Nicolae Popesco and Pierre Gabriel. Caractérisation des catégories abéliennes avec générateurs et limites inductives exactes. *COMPTES RENDUS HEBDOMADAIRES DES SEANCES DE L ACADEMIE DES SCIENCES*, 258(17):4188, 1964.
- [Ste75] Bo Stenström. Rings and modules of quotients. In *Rings of Quotients*, pages 195–212. Springer, 1975.
- [Tak71] Mitsuhiro Takeuchi. A simple proof of gabriel and popesco’s theorem. *Journal of Algebra*, 18(1):112–113, 1971.