Artin-Rees

May-09-11
9:26 AM

$$M \cap I_F^k \subseteq I_F(M \cap I_F^{k-1}) + (M \cap I_F^{k-1}) \cdot I_F$$

"Non-commutative Artin-Rees with $s=1$".

From Lang's Algebra, page 429:

We reformulate the Artin-Rees theorem in its original form as follows.

Corollary 5.5. *Let A be a Noetherian ring, E a finite A-module, and F a submodule. Let $\mathfrak{a}$ be an ideal. There exists an integer s such that for all integers $n \geqq s$ we have*

$$\mathfrak{a}^n E \cap F = \mathfrak{a}^{n-s}(\mathfrak{a}^s E \cap F).$$