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Generalization of the HNP Ring and its Application

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Abstract

In this study, link between ring and polynomial have examined. Through Hilbert's Base Theorem have been found that the polynomial ring formed from the Noether ring is also Noether ring. Some researchers have elaborated ways to prove Hilbert's Theorem.

The nature of a ring is not always preserved in the polynomial ring over it. Let's say in Dedekind domain. Polynomials detained from the Dedekind domain are not Dedekind domain. The Dedekind domain is an integral domain that can ideally be reversed. In fact, the properties of the Noether ring are weaker than Dedekind domain. However, the polynomial ring over the Dedekind domain form a weaker structure than the Dedekind domain called the Dedekind-G domain. The Dedekind-G domain does not demand that its whole ideal be reversed. The Dedekind-G domain only demands its an integral ideal that can be reversed. It has also been found that the polynomial ring formed from the Dedekind-G domain is also Dedekind-G domain.

A similar situation is then applied to a noncommutative ring. It is known that for a noncommutative situation, a structure similar to that of Dedekind is the Dedekind prime ring. That is, in a commutative situation, Dedekind prime ring is Dedekind domain. As for the Dedekind domain, the polynomial ring over the Dedekind prime ring also form a structure defined as the Dedekind-G prime ring. The definition of Dedekind-G prime ring is in line with the understanding of Dedekind-G domain. Keep in mind that every Dedekind prime ring is a prime Noether herditer ring and maximum ring order. Understanding Dedekind-G prime ring still demands Noether's terms and maximum order. Furthermore, the polynomial ring formed from the Dedekind-G prime ring is also the Dedekind-G prime ring