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"Free Resolutions"

Abstract:

Hilbert introduced the idea to describe the structure of a module M by an exact sequence of free modules and maps between them. Such a sequence is called a free resolution of M. In essence, constructing a resolution consists of repeatedly solving systems of linear equations over a ring. Recent computational methods have made it possible to compute free resolutions by computer. If the ring and the module are graded then there exists a minimal free resolution of M. It is unique up to an isomorphism and is contained in any free resolution of M.

In this talk I will discuss the relations between the structure of a module and the properties of its minimal free resolution.