A Study on Gorenstein Projective Dimension of a Module

Aye Aye Naing[1] and Hnin Lè. Yee[2]

Abstract

In this paper, for any associated ring R, some properties of any left R-modules with finite Gorenstein projective dimension are studied. Then, we prove that for any associated ring R, and for any left R-module M with finite injective dimension, the Gorenstein projective dimension $\mathrm{Gpd}_R M$ equals to the usual projective dimension $\mathrm{pd}_R M$. In particular, if $\mathrm{Gpd}_R R$ is finite, then $\mathrm{pd}_R R$ is also finite, and thus R is Gorenstein (provided that R is commutative and Noetherian).

Keywords: associated ring, projective dimension, Gorenstein projective dimension.

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1. Associate Professor, Dr., Department of Mathematics, Yangon University of Education
2. Professor and Head, Dr., Department of Mathematics, Yangon University of Education