



## Cohen-Macaulay module

Canonical name	CohenMacaulayModule
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Entry type	Definition
Classification	msc 13C14
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Defines	Cohen-Macaulay ring
Defines	C-M module
Defines	C-M ring

A module  $M$  over a ring  $R$  is a Cohen-Macaulay module if its depth is defined and equals its Krull dimension. A ring is said to be Cohen-Macaulay (or just C-M) if it is a Cohen-Macaulay module viewed as a module over itself.

Cohen-Macaulay rings are used extensively in combinatorial geometry and commutative ring theory, and has applications to algebraic geometry as well. For instance, a variety all of whose local rings are Cohen-Macaulay has, in a sense, nicer behaviour than an arbitrary singular variety.