

List of Symbols

$J(R)$	Jacobson radical	0-2
λ_a	multiplication by a	1-1
$r_M(N)$	radical of annihilator of M/N	1-1
$\text{AP}(M)$	associated primes of M	1-3
$z(M)$	zero-divisors of M	1-4
M_S	localization of M by S	1-6
$\text{Supp } M$	support of M	1-8
$V(I)$	set of prime ideals containing I	1-8
$N(R)$	nilradical	1-12
$l_R(M)$	length of the R -module M	1-13
R_c	integral closure of R in a larger ring	2-3
R_T	localized ring	2-5
\sqrt{I}	radical of an ideal I	2-8
V	valuation ring	3-3
$ x $	absolute value	3-5
v	discrete valuation	3-5
$\{R_n\}$	filtration of a ring	4-1
$\{M_n\}$	filtration of a module	4-1
$\text{gr}(R)$	associated graded ring	4-2
$\text{gr}(M)$	associated graded module	4-2
$\lim_{\leftarrow} M_n$	inverse limit	4-4
\hat{M}	completion of a module	4-5
ΔG	difference of G	5-1
$k^{(r)}$	analog of x^r in the calculus of finite differences	5-1
$n \gg 0$	for sufficiently large n	5-2
l	length	5-3
$h(M, n)$	Hilbert polynomial	5-4
$s_I(M, n)$	Hilbert-Samuel polynomial	5-5
$d(M)$	degree of the Hilbert-Samuel polynomial	5-5
\dim	dimension	5-6
ht	height	5-7
coht	coheight	5-7
$\delta(M)$	Chevalley dimension of the module M	5-7
tr deg	transcendence degree	5-14
$\text{pd}_R M$	projective dimension	7-1
$\text{gldim } R$	global dimension	7-2
Ext	Ext functor	7-2
$\text{id}_R N$	injective dimension	7-4
Tor	Tor functor	7-5
I -depth	maximum length of an M -sequence in I	7-7

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(R, \mathcal{M}, k) local ring with maximal ideal \mathcal{M} and residue field k 8-1