Graded

1. (17.1.10)

   (a) Prove that an arbitrary direct sum $\oplus_{i \in I} P_i$ of projective modules P_i is projective and that an arbitrary direct product $\prod_{j \in J} Q_j$ of injective modules Q_j is injective.

   (b) Prove that an arbitrary direct sum of projective resolutions is again projective and use this to show $\operatorname{Ext}_R^n(\oplus_{i \in I} A_i, B) \cong \prod_{i \in I} \operatorname{Ext}_R^n(A_i, B)$ for any collection of R-modules A_i ($i \in I$). [cf. Exercise 12 in Section 10.5.]

   (c) Prove that an arbitrary direct product of injective resolutions is an injective resolution and use this to show $\operatorname{Ext}_R^n(A, \prod_{j \in J} B_j) \cong \prod_{j \in J} \operatorname{Ext}_R^n(A, B_j)$ for any collection of R-modules B_j ($j \in J$). [cf. Exercise 12 in Section 10.5.]

   (d) Prove that $\operatorname{Tor}_n^R(A, \oplus_{j \in J} B_j) \cong \oplus_{j \in J} \operatorname{Tor}_n^R(A, B_j)$ for any collection of R-modules B_j ($j \in J$).

2. (17.2.8) Suppose G is cyclic of order m with generator σ and let $N = 1 + \sigma + \sigma^2 + \cdots + \sigma^{m-1}$.

Additional Problems

1. (17.1.9, 17.1.15, 17.1.21, 17.2.6)

Feedback

1. None.

2. Things seem to be the same I think.