

SF2735 Homologisk Algebra
Exercise set 1

Examinator: Roy Skjelnes

The solutions to these exercises are to be handed in no later than Thursday, 8th of October. Please pay attention to the presentation as well as the arguments given in the solutions.

Exercise 1

Let m and n be two integers. Describe $\text{Hom}_{\mathbf{Z}}(\mathbf{Z}/(m), \mathbf{Z}/(n))$.

Exercise 2

Let M_i be an A -module for each $i \in I$, where I is some indexing set. Show that there is a natural A -module homomorphism

$$\phi: \bigoplus_{i \in I} \text{Hom}_A(M_i, N) \rightarrow \text{Hom}_A(\bigoplus_{i \in I} M_i, N)$$

for any A -module N . Determine whether ϕ is injective and/or surjective.