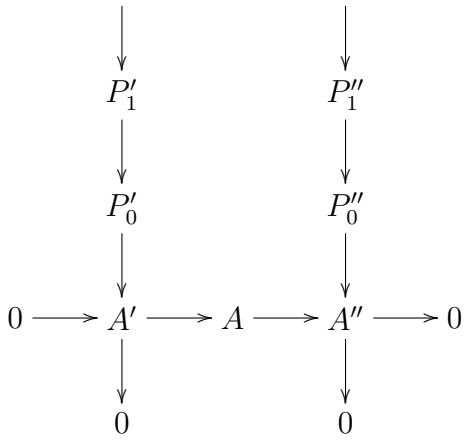
MATH 724
SUMMER 2009
HOMEWORK 2

Some other (not necessarily distinct) time.

1. (5 pt) Consider the diagram



where the columns are projective resolutions and the bottom row is exact. She that there is a projective resolution of A and chain maps such that the columns form an exact sequence of complexes.

2. (5 pt) Let $0 \longrightarrow A \longrightarrow B \longrightarrow C \longrightarrow 0$ be a short exact sequence of $R-$modules. If T is a covariant (additive) functor then show that there is a long exact sequence

$$\cdots \longrightarrow \mathrm{L}_n \mathrm{T}A \longrightarrow \mathrm{L}_n \mathrm{T}B \longrightarrow \mathrm{L}_n \mathrm{T}C \longrightarrow \mathrm{L}_{n-1} \mathrm{T}A \longrightarrow \cdots$$

$$\cdots \longrightarrow \mathrm{L}_0 \mathrm{T}A \longrightarrow \mathrm{L}_0 \mathrm{T}A \longrightarrow \mathrm{L}_0 \mathrm{T}A \longrightarrow 0.$$