MATH 726
SUMMER 2005
HOMEWORK 5

Due Friday August 5, 2005.

1. (5pt) Let A and B be abelian groups. Show that $\mathrm{Ext}^n_{\mathbb{Z}}(A, B) = 0$ for all $n \geq 2$.

2. (5pt) Compute $\mathrm{Ext}^1_{\mathbb{Z}}(A, B)$ where A is a finitely generated abelian group.

3. (5 pt) Let A and B be abelian groups. Show that $\mathrm{Tor}^{\mathbb{Z}}_n(A, B) = 0$ for all $n \geq 2$.

4. (5pt) Let R be an integral domain. Show that if the $R-$module B is a torsion module, then $\mathrm{Tor}^R_n(A, B)$ is torsion for all $n \geq 0$.

5. (5pt) Let R be an integral domain. Show that $\mathrm{Tor}^R_n(A, B)$ is torsion for all $R-$modules A and B and $n \geq 1$. (Hint: You may assume that any torsion free $R-$module may be embedded in a vector space over K, the quotient field of R).