Fall 2012: Algebra Graduate Exam

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Problem 1. Use Sylow's theorems directly to find, up to isomorphism, all possible structures of groups of order $5 \cdot 7 \cdot 23$.

Proof.

Problem 2. Let A , B , and C be finitely generated $F[x] = R$ modules for F a field with C torsio Show that $A \otimes_R C \cong B \otimes_R C$ implies that $A \cong B$. Show by example that this conclusion can fail whe not torsion free.	
Proof.	