MATH 251 PROBLEMS

(1) Let $A \to B$ be an abelian group homomorphism. What is the fibered product $A \times_B 0$ in elementary terms? What is the cofibered coproduct $0 \sqcap^A B$?
(2) Prove that a group object in *Groups* is an *abelian* group.
(3) Lang p 115 ex 1,3,4
(4) If $S \subset R$ contains no zero divisors, show that $R \to S^{-1}R$ is injective.
(5) Prove that if $p \neq q$ are distinct primes, then $\mathbb{Z}_{(p)} \not\cong \mathbb{Z}_{(q)}$.
(6) Let M be a finitely generated R module and $S \subset R$ multiplicative. Show that $S^{-1}M = 0$ if and only if there is $d \in S$ with $dM = 0$.
(7) Lang p. 253 ex 2,3,5,6,11