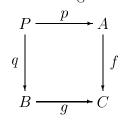
Problem set for Advanced Algebra

- (37) Let $f, g : X \to Y$ be two maps. Show that the set $\{x \in X | f(x) = g(x)\}$ with the inclusion map into X is an equalizer of $f, g : X \to Y$.
- (38) (a) Let the commutative diagram



be a pullback (a limit) of the morphisms $f : A \to C$ and $g : B \to C$. Assume that g is a monomorphism. Show that p is also a monomorphism.

- (b) Show that the category of sets has pullbacks.
- (39) Let X and Y be two sets. Show that the disjoint union $X \dot{\cup} Y$ is a coproduct of X and Y in the category of sets.
- (40) Show that the category of sets has coequalizers.

Due date: Tuesday, 8.1.2002, 16:15 in Lecture Hall 138