MA 665 EXERCISES 7

(1) (a) Show that any two zero objects in a category are isomorphic, up to unique isomorphism.
   (b) Let A and B be objects in a category, and let Z, Z' be zero objects. Show that the zero morphisms from A to B corresponding to Z and Z' are in fact the same morphism.

(2) Does a functor have to take an initial object to an initial object? Does a functor have to take a terminal object to a terminal object? For each, either prove or provide a counterexample.

(3) Prove that, in an additive category, the product of two objects A and B is also a coproduct of A and B.