Abelian Closures

January-14-11
8:42 AM

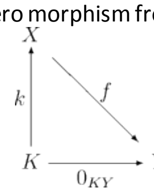
tensor?

Is there "an Abelian Closure" for an additive category?

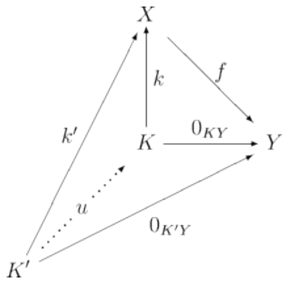
kernel

To be more explicit, the following universal property can be used. A kernel of f is any morphism $k : K \to X$ such that:

- $f \circ k$ is the zero morphism from K to Y;



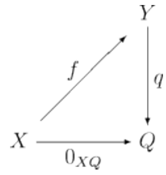
- Given any morphism $k' : K' \to X$ such that $f \circ k'$ is the zero morphism, there is a unique morphism $u : K' \to K$ such that $k \circ u = k'$.



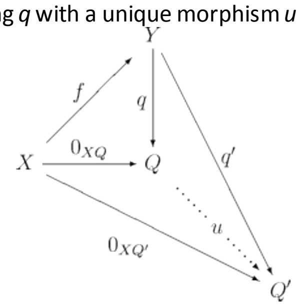
Pasted from <http://en.wikipedia.org/wiki/Kernel_(category_theory)>

co-kernel

Explicitly, this means the following. The cokernel of $f : X \to Y$ is an object Q together with a morphism $q : Y \to Q$ such that the diagram



commutes. Moreover the morphism q must be universal for this diagram, i.e. any other such $q' : Y \to Q'$ can be obtained by composing q with a unique morphism $u : Q \to Q'$:



Pasted from <http://en.wikipedia.org/wiki/Cokernel>

Is there a "universal" version to the smallest tensor category containing (R, I), and all product maps, where R is a non-commutative ring and I is an ideal in it?