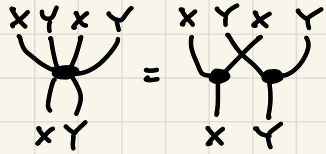
Assume a symmetric monoidal category s.t.

1) Every object carries a comonoid 

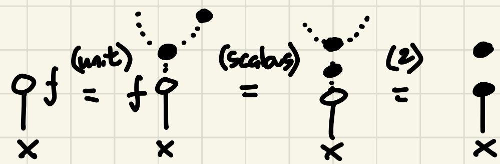
2) Every morphism is a homomorphism w.r.t. these comonoids

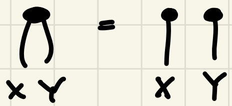
3) The comonoids are uniform : 

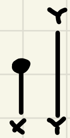
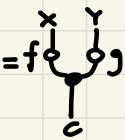
Lemma

The monoidal unit is terminal.

Proof

Let $f : X \longrightarrow I$ be arbitrary, then  $\square$

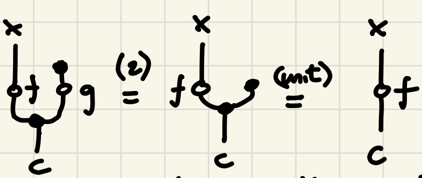
Corollary :  Proof. From uniqueness. $\square$

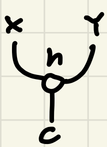
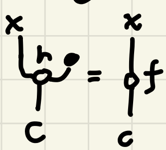
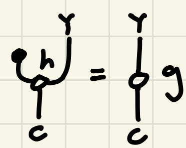
Define: $\pi_1 :=$  , $\pi_2 :=$  and for $f : C \to X$, $g : C \to Y$ $\langle f, g\rangle :=$ 

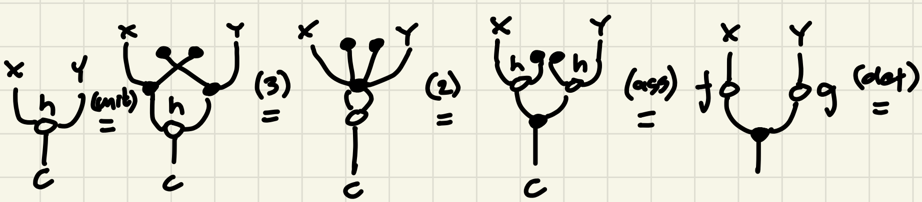
Lemma [$X \otimes Y$ is a product]

$\pi_1 \circ \langle f, g\rangle = f$, $\pi_2 \circ \langle f, g\rangle = g$, and is the unique such morphism.

Proof

$\pi_1\langle f, g\rangle =$  , and symmetrically for $\pi_2\langle f, g\rangle = g$.

Now assume  s.t.  and  . Then :

 $= \langle f, g\rangle$ $\square$