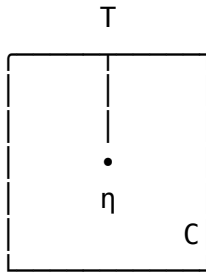
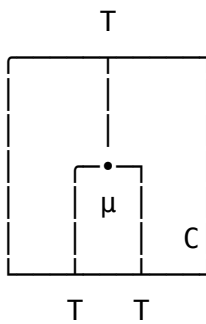


Consider a monad  $(T, \eta, \mu)$  on  $\mathcal{C}$  we draw the return  $\eta : \mathbf{1}_{\mathcal{C}} \Rightarrow T$  and the join  $\mu : T^2 \Rightarrow T$  as string diagrams

- $\eta : \mathbf{1}_{\mathcal{C}} \Rightarrow T$

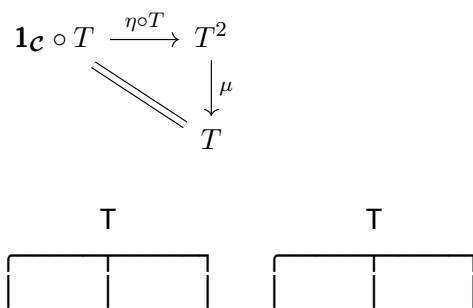


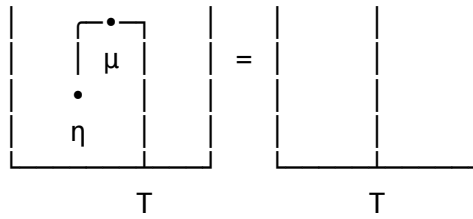
- $\mu : T^2 \Rightarrow T$



The monad laws become

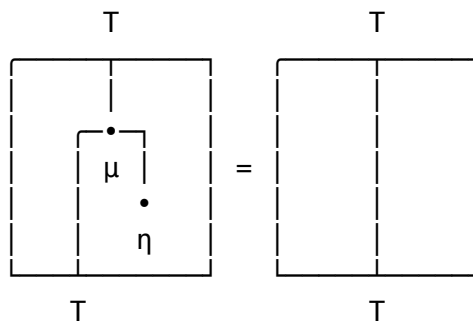
- left unitality





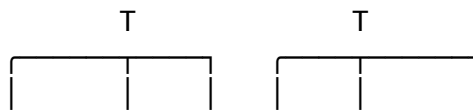
- right unitality

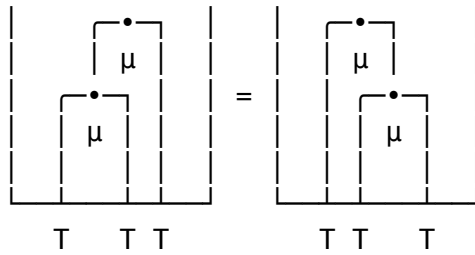
$$\begin{array}{ccc}
 T^2 & \xleftarrow{T \circ \eta} & T \circ \mathbf{1c} \\
 \downarrow \mu & \swarrow & \\
 T & & 
 \end{array}$$



- associativity

$$\begin{array}{ccc}
 & T^3 & \\
 \mu \circ T \swarrow & & \searrow T \circ \mu \\
 T^2 & & T^2 \\
 \mu \swarrow & & \searrow \mu \\
 & T & 
 \end{array}$$





See [1] Ch.4 and Category Theory III 2.2, String Diagrams part 2 - YouTube

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[1] D. Marsden, *Category Theory Using String Diagrams*, (2014).

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