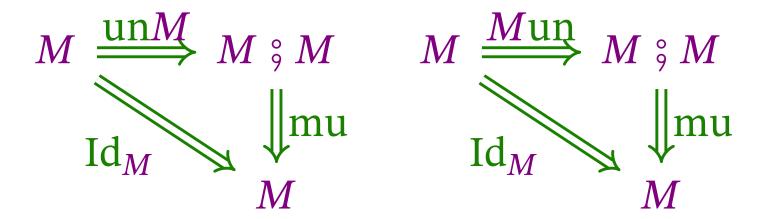
**Definition** (Monad). Let **C** be a category. A monad on **C** is specified by: Constituents

- 1. A functor  $M: \mathbb{C} \to \mathbb{C}$ ;
- 2. A natural transformation un :  $Id_{\mathbb{C}} \Rightarrow M$ , called the *unit*;
- 3. A natural transformation mu :  $M \, ; M \Rightarrow M$ , called the *composition* or *multiplication*.

## Conditions

1. Left and right unitality: the diagrams



must commute.

2. Associativity: the diagram

$$M \stackrel{\circ}{\circ} M \stackrel{\circ}{\circ} M \xrightarrow{M mu} M \stackrel{\circ}{\circ} M$$

$$\downarrow muM \qquad \qquad \downarrow mu$$
 $M \stackrel{\circ}{\circ} M \xrightarrow{mu} M$ 

must commute.