

**Definition** (Semigroup morphism). A morphism  $F : \mathbf{S} \rightarrow \mathbf{T}$  between semigroups

$$\mathbf{S} = \langle \mathbf{S}, \circ_{\mathbf{S}} \rangle \quad \text{and} \quad \mathbf{T} = \langle \mathbf{T}, \circ_{\mathbf{T}} \rangle$$

is a function  $F : \mathbf{S} \rightarrow \mathbf{T}$  such that for all  $x, y \in \mathbf{S}$ ,

$$F(x \circ_{\mathbf{S}} y) = F(x) \circ_{\mathbf{T}} F(y).$$