

**Definition** (Semigroup isomorphism). Let  $\mathbf{S}$  and  $\mathbf{T}$  be semigroups. A homomorphism of semigroups  $F : \mathbf{S} \rightarrow \mathbf{T}$  is called a *semigroup isomorphism* if there exists a homomorphism of semigroups  $G : \mathbf{T} \rightarrow \mathbf{S}$  such that

$$F \circ G = \text{Id}_{\mathbf{S}} \text{ and } G \circ F = \text{Id}_{\mathbf{T}}.$$