called a semigroup isomorphism if there exists a morphism of semigroups $G: \mathbf{T} \to \mathbf{T}$

S such that

Definition (Semigroup isomorphism). A morphism of semigroups $F: \mathbf{S} \to \mathbf{T}$ is

 $F : G = \mathrm{Id}_{\mathbf{S}}$ and $G : F = \mathrm{Id}_{\mathbf{T}}$.