Definition (Semigroup homomorphism)**.** Let $\mathbf{S}$ and $\mathbf{T}$ be semigroups. A homomorphism of semigroups from $\mathbf{S}$ to $\mathbf{T}$ is a function $F : \mathbf{S} \to \mathbf{T}$ such that for all $x, y \in \mathbf{S}$,

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