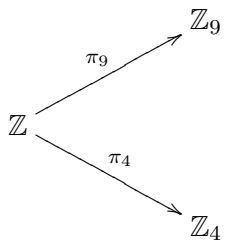
# Topologie 2009/2010
# Lecturer: Marius Crainic

EXERCISE 0.1. *Consider the following starting data*

(0.1)




*where $\mathbb{Z}_n$ is the group of integers modulo $n$ and $\pi_n : \mathbb{Z} \longrightarrow \mathbb{Z}_n$ is the canonical map ($k \mapsto k$modulo $n$).*

(1) *Show that, for any group $(G, \cdot)$, if $a \in G$ satisfies $a^9 = a^4 = 1$, then $a = 1$ (recall that $1 \in G$ denotes the unit of $G$ and $a^4 = a \cdot a \cdot a \cdot a$, similarly $a^9$ etc).*
(2) *Show that the amalgamated product associated to the starting data is the trivial group.*
(3) *What do you get if you replace $\mathbb{Z}_9$ by $\mathbb{Z}_6$ (and, of course, $\pi_9$ by $\pi_6$)? Explain your answer.*