Problem 56. Show that inverses in a group are unique.

In the problems below, let $G$ be a group and suppose $a, b, c \in G$. We will denote the inverse of $a$ by $a^{-1}$ and the identity of $G$ by $e$.

Problem 57. Show that $ab = ca$ does not necessarily imply that $b = c$.

Problem 58. Show that if $a^2 = a$, then $a = e$.

Problem 59. Show that if $abc = e$, then $bca = e$. 