[redacted] Let (A,) be a semigroup. Show that for a, b, c ∈ A, if ac = ca and bc = cb, then (ab)c = c(a*b).

Solution:

Given, $a*c = c*a$

$b*c = c*b, \forall a, b, c \in A$

To Show,

$(a*b)*c = c*(a*b)$

Taking LHS,

$(a*b)*c = a*(b*c)$ [Using associative law]

$= a*(c*b)$ [$\because b*c = c*b$]

$= (a*c)*b$ [Using associative law]

$= (c*a)*b$ [$\because a*c = c*a$]

$= c*(a*b)$ [Using associative law

Hence proved.