

Practice Problem 2

Consider a set S and a binary operator $*$, i.e., for each $a, b \in S$, $a * b \in S$. Assume $(a * b) * a = b$ for all $a, b \in S$. Prove that $a * (b * a) = b$ for all $a, b \in S$.

Solution: If we replace a by $b * a$ in the hypothesis, we get $((b * a) * b) * (b * a) = b$, for all $a, b \in S$. Since $(b * a) * b = a$, we have $a * (b * a) = b$ for all $a, b \in S$.