PRODUCT OF NORMAL SUBGROUPS – PRACTICE

Theorem: Let *G* be a group, let *M* and *N* be normal subgroups of *G* such that $MN = G$ and $M \cap N = e$ (the identity). Then if $m_1, m_2 \in M$ and $n_1, n_2 \in N$ such that $m_1 n_1 = m_2 n_2$, it follows that $m_1 = m_2$ and $n_1 = n_2$. In other words, each element in *G* can be represented in a unique way as a product of an element in *M* with an element in *N*.

Proof: