Question: 12

If $ghg^{-1} \in H$ for all $g \in G$ and $h \in H$, show that the left cosets are identical to the right cosets. That is, show $gH = Hg$ for all $g \in G$.

Solution:

Question: 17

Suppose that $[G : H] = 2$. If a and b are not in H, show that $ab \in H$.

Solution:

Question: 19

Let H and K be subgroups of group G. Prove that $gH \cap gK$ is a coset of $H \cap K$ in G.

Solution:

Question: 20

Let H and K be subgroups of group G. Define a relation $\sim$ on G by $a \sim b$ if there exists an $h \in H$ and a $k \in K$ such that $hak = b$. how that this relation is an equivalence relation. The corresponding equivalence classes are called ***double cosets***. Compute the double cosets of $H = \{(1), (1\ 2\ 3), (1\ 3\ 2)\}$ in A_4.

Solution: