PRINT Your Name:⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯

Quiz for October 8, 2004

Suppose that H is a subgroup of the group G and ghg^{-1} is in H for all $g \in G$ and $h \in H$. Let h_1 be an arbitrary element of H and g be an arbitrary element of G. Prove that there exists an element h of H with $h_1 = ghg^{-1}$. (It is possible to give a proof which works for infinite groups as well as finite groups.)

ANSWER: Let $h = g^{-1}h_1g$. It is clear that

$$ghg^{-1} = g(g^{-1}h_1g)g^{-1} = h_1;$$

and the hypotheses ensures that h is an element of H.