

MATH 580
SUPPLEMENTAL HOMEWORK PROBLEMS #2

1. Let G be a group with normal subgroups H and K . Show that $H \cap K$ is a normal subgroup of G .
2. Let G be a group with subgroup H and normal subgroup N . Show that $H \cap N$ is a normal subgroup of H .
3. Let G be a group and H a subgroup. Show that H is a normal subgroup of G if and only if $H \cdot g = g \cdot H$ for all $g \in G$.
4. Let G be a group and H a subgroup having index 2 in G (i.e., $[G : H] = 2$). Show that H is normal in G .