1.42: Factor group

Let N be a normal subgroup of a group G. The **factor group** or **quotient group** G/N is the set of all left cosets of N in G, i.e.:

$$G/N = \{aN : a \backslash \mathrm{isin} G\}.$$

For each aN and bN in G/N, the product of aN and bN is (aN)(bN), which is still a left coset. In fact, because N is normal:

(aN)(bN) = a(Nb)N = a(bN)N = (ab)NN = (ab)N.

The inverse of an element aN of G/N is a^{-1}N.