

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.:

$$G/N = \{aN : a \in G\}.$$

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 $a^{-1}N$.

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