a member of the set. The Cayley table for this set is

$\times_{24}$	1	5
1	1	5
5	5	1

so the set is closed. All the subgroup axioms are satisfied, so $\{1,5\}$ is a subgroup under the operation multiplication modulus 24.

Consider $\{1,5,7,11\}$. From the Cayley table this set is closed. Each element is self inverse so has an inverse which is a member of the set. The identity is a member of the set. All the subgroup axioms are satisfied, so the set is a subgroup under multiplication modulus 24, and the Group G has a subgroup of order 4, $\{1,5,7,11\}$.

Also every Group G has as a subgroup the group G itself, so G has a subgroup of order 8.

5/5

(b) $H=\{1,5\}$ $\qquad$ $H=\{1,5\}$

$7H=\{7,11\}$ $\qquad$ $H7=\{7,11\}$

$13H=\{13,17\}$ $\qquad$ $H13=\{13,17\}$

$19H=\{19,23\}$ $\qquad$ $H19=\{19,23\}$

The left and right cosets of H are the same hence the subgroup H is normal in G.

Alternatively, multiplication is commutative, hence the group G is Abelian, so H is normal in G. The Cayley table is symmetric about the main diagonal, so the group can be identified as Abelian by this route.

1

This better reason.