Reading notes on Chapter 6: Cosets and Lagrange's Theorem

In chapter 4 on cyclic groups you proved in theorem 4.10 that every subgroup of a cyclic group is cyclic (i.e. generated by a single element) and moreover, in theorem 4.13, that the order of any element of a cyclic group divides the order of the group.

This latter result generalises to the famous Lagrange's Theorem, which says that in any finite group G, the order of any subgroup of G is always a divisor of the order of G.