Cohomology of Finite Groups without Homological Algebra

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The concept of a group is one of the main algebraic concepts. The most interesting and useful class of groups is the class of finite groups. Finite groups are actively used not only in mathematics but also in physics and chemistry. Homological algebra is the one of fastest growing parts of algebra. Homology and cohomology allow to establish a lot of information about mathematical objects. That is why it is so important to discover something new about them. Our work is devoted to a proof of explicit formulas for the homology and cohomology of a finite group that uses only simple operations such as quotient, tensor product and G-invariants. These formulas do not use homological algebra. During the research four lemmas was proved. As a result lemmas and formulas have been proven. Moreover, tree well-known statements were proved as corollaries of the main theorem. This shows that the result is correct and useful. The obtained formulas are interesting because they do not use the notion of a complex. In other words, they do not use homological algebra at all. So these formulas give an alternative method of computation the homology and cohomology of finite groups.

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