Abstract

The definition of a group in abstract algebra is the most important concept and has a fundamental function. One of the group categories is finite abelian groups. A Finite Abelian Group is a group that has finite elements and the defined operation is commutative.

If let G be any finite abelian group, then G is the direct product of its subgroups P_1, P_2, ... , P_n or annotated $G = P_1 x \ldots x P_k$. Subgroups' P_1, P_2, ... , P_n are the Sylow subgroup of G. Each p_i-Sylow Subgroup is then the direct product of cyclic group. If G is a finite abelian group, then $G = A_1 x \ldots x A_n x B_1 x \ldots B_n x \ldots x C_1 x \ldots x C_n$, where A_i, B_i, C_i are individually the cyclic subgroups of G.

If G and G' are abelian groups of order p^n and $G = A_1 x \ldots x A_k$, where each A_i is a cyclic group of order p^{n_i}, $n_1 \geq \ldots \geq n_k > 0$, and $G' = B_1 x \ldots x B_s$, where B_i is a cyclic group of order p^{h_i}, $h_1 \geq \ldots \geq h_s > 0$, then G and G' are isomorphic if and only if $k = s$ and for i, $n_i = h_i$. Therefore, if G is an abelian group of order p^n, p a prime then number of nonisomorphic group with G, equals the number of partitions of n are known.