

groups of small order*

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Below is a list of all possible groups per order up to isomorphism.

Groups of prime order:

- All groups of prime order are isomorphic to a cyclic group of that order.

Groups of prime square order:

- All groups of order p^2 , where p is a prime, are isomorphic to one of the following:
 - $C_{p^2}(\textit{Abelian})$: cyclic group of order p^2 .
 - $C_p \times C_p(\textit{Abelian})$: elementary abelian group of order p^2 .

Groups of order 1:

- trivial group (*i.e.* $\{e\}$).

Groups of order 6:

- $C_6(\textit{Abelian})$: cyclic group of order 6.
- $S_3(\textit{non-Abelian})$: symmetric group where $n = 3$.

Groups of order 8:

- $C_8(\textit{Abelian})$: cyclic group of order 8.
- $C_4 \times C_2(\textit{Abelian})$: direct product of two groups of a cyclic group of order 4 and a cyclic group of order 2.
- $C_2 \times C_2 \times C_2(\textit{Abelian})$: direct product of three groups of a cyclic group of order 2.
- $D_4(\textit{non-Abelian})$: octic group; dihedral group of degree 4.

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- Q_8 (*non-Abelian*): quaternion group.

Groups of order 10:

- C_{10} (*Abelian*): cyclic group of order 10.
- D_5 (*non-Abelian*): dihedral group of degree 5.

Groups of order 12:

- C_{12} (*Abelian*): cyclic group of order 12.
- $C_2 \times C_6$ (*Abelian*).
- A_4 (*non-Abelian*): alternating group of degree 4.
- D_6 (*non-Abelian*): dihedral group of degree 6.
- $\text{Dic}(C_6)$ (*non-Abelian*): dicyclic group of order 12. This is a generalized quaternion group Q_{12} .

Groups of order 14:

- C_{14} (*Abelian*): cyclic group of order 14.
- D_7 (*non-Abelian*): dihedral group of degree 7.

Groups of order 15:

- C_{15} (*Abelian*): cyclic group of order 15.

References

- [PJ] Pedersen, John: Groups of small order.
http://www.math.usf.edu/~eclark/algctlg/small_groups.html