

## 1.98: Subgroup

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Let  $G$  be a group and  $H$  a non-empty subset of  $G$ . Then  $H$  is called a **subgroup** of  $G$  if the elements of  $H$  obey the group postulates, i.e. if

1. the identity element  $1_G$  of  $G$  is contained in  $H$ ;
2.  $H$  is closed under the group operation (inherited from  $G$ );
3.  $H$  is closed under taking inverses.

The subgroup  $H$  is called a **proper subgroup** of  $G$  if there are elements of  $G$  not contained in  $H$ .

A subgroup  $H$  of  $G$  is called a **maximal subgroup** of  $G$  if there is no proper subgroup  $M$  of  $G$  such that  $H$  is a proper subgroup of  $M$ .

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