

# From Mathematics to Generic Programming

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## 6.4

*Solution.*

The order of  $e$  is 1 because the order of an element  $a$  of some group is defined as the smallest  $m$  such that  $a^m = e$ . Well,  $e^1 = e$ .  $e0$  is not necessarily equal to  $e$  (what could it equal?), and the definition (6.7) of the **order** of an element happens to explicitly define this value for values of  $m > 0$ .

Now, suppose some other element  $a_0$  satisfied

$$a_0^1 = e.$$

Then by the definition of raising a group to a power,  $a_0^1 = a_0 = e$ . So  $e$  is the only element of order 1.