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, $e^1 = e$. e^0 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.