

English question...

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Hello sir~

Show that a group G with at least two elements but with no proper nontrivial subgroups must be finite and of prime order.

I want to know what the word "but with" means ?
is these "but" meaningless ?

For reference, I can show it.
Anyway, group G must be cyclic by assumption.

If $|G|$ is infinite, then $G \cong \mathbb{Z}$. (iso)
so, G has proper nontrivial subgroups.
so, contradiction.

If $|G|$ is not prime,
then there is "d" such that $d \mid |G|$ and $1 < d < |G|$.
Let $G = \langle a \rangle$
 $|a^{(n/d)}| = n / ((n/d), n) = d$.
so, $\langle a^{(n/d)} \rangle$ is proper nontrivial subgroup.
so, contradiction.

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