Re: algebra with order.

Source: http://sci.tech−archive.net/Archive/sci.math/2006−07/msg00978.html

- *From*: Bill Dubuque <wgd@xxxxxxxxxxxxxxxxxxxx>
- *Date*: 06 Jul 2006 13:38:18 −0400

Arturo Magidin <magidin@xxxxxxxxxxxxxxxxx> wrote:

> mina_world <mina_world@xxxxxxxxxxx> wrote:
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>> "Arturo Magidin" <magidin@xxxxxxxxxxxxxxxxx> wrote:
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>>> mina_world <mina_world@xxxxxxxxxxx> wrote:
>>>
>>>> let G be an abelian group and
>>>> let H and K be finite cyclic subgroups with
>>>> |H|=r and |K|=s.
>>>>
>>>> if H=<a>, K=<b>, |ab| = lcm(r,s).
>>>
>>> Assuming |ab| means the order of the element ab, this is
>>> false.
>>> Take H=K, b=a^{−1}.
>>
>> maybe, i look like confusing.
>> i know that if r and s are relatively prime, then |ab|=lcm(r,s)
>
> Yes; in fact, the conclusion holds with more generality than the
> case where r and s are relatively prime, but this much is correct.
>
>> and G contains a cyclic subgroup of order lcm(r,s)
>
> Yes. But that subgroup need not be generated by ab. It can always be
> generated by an element which is equal to a product of a power of a by
> a power of b. If you don't know how, try the following hint: try to
> pick a power of a, a^n, and a power of b, b^m, such that the orders of
> a^n and of b^m are relatively prime, and the lcm of those orders
> equals the lcm of r and s.

This is a FAQ. For further details see my prior post (esp. its link)
http://google.com/groups?threadm=y8ziswesnyl.fsf%40nestle.ai.mit.edu

−−Bill Dubuque
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