

Re: Easy question in algebra

Source: <http://sci.tech-archive.net/Archive/sci.math/2005-08/msg03828.html>

- *From:* quasi <quasi@xxxxxxxx>
 - *Date:* Sat, 20 Aug 2005 20:55:17 -0700
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On Sun, 21 Aug 2005 02:19:26 +0200, Anna Jansen
<ajansen77_spamfree@xxxxxx> wrote:

>Hi,
>
>I suppose this is an easy question in algebra:
>Let p, q be prime. Let further $p=2q+1$. Let g be an element of order q of
>the multiplicative group Z_p^* . So g is a generator of the order- q
>subgroup of Z_p^* . Every element $h=g^x$, for $x \in \{1, \dots, q-1\}$ is a
>generator of G . Is this correct? I suppose yes. Why is it not correct
>for $x=q$? Is the reason for that, that $g^q=1$ and 1 is not a generator of G ?
>
>Thanks for your help

Yes and yes.

Your reasoning is correct.

In any group, 1 has order 1 no other element can have order 1.

In this subgroup, since q is prime and since the order of an element must divide the order of any containing group, all elements other than 1 must have order exactly q , hence they generate the subgroup.

quasi

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• *References:*

◆ [*Easy question in algebra*](#)

◇ *From:* Anna Jansen

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