Re: GCD(0,0)

Source: http://sci.tech−archive.net/Archive/sci.math/2005−12/msg05194.html

- *From*: quasi <quasi@xxxxxxxx>
- *Date*: Thu, 29 Dec 2005 20:58:08 −0500

On 29 Dec 2005 19:59:26 −0500, hrubin@xxxxxxxxxxxxxxxxxxxx (Herman
Rubin) wrote:

>In article <1135888209.029280.145500@xxxxxxxxxxxxxxxxxxxxxxxxxxxx>,
>Leroy Quet <qqquet@xxxxxxxxxxxxxx> wrote:
>>I notice that these math−controversy threads often get massive
>>numbers of replies.
>>(While more serious math posts and my games, for example,
>>hardly ever get any replies.)
>>So I will post this troll−bait flame−bait message to sci.math
>>because I always wanted to start one of those huge threads.
>>:)
>
>>For n = any positive integer, it is known that
>
>>GCD(n,n) = n
>
>>and
>
>>GCD(0,n) = n.
>
>>(GCD is Greatest Common Divisor, of course.)
>
>>But what is, if there is any defined value,
>
>>GCD(0,0)?
>
>>It certainly isn't 0 (which would fit the pattern above if
>>n=0), is it?
>>I would think that infinity would work as well as anything.
>
>>Or is GCD(0,0) simply undefined, like 0/0?
>
>
>>thanks, (half seriously, oh well, 3/4 seriously)
>>Leroy Quet
>
>When it comes to common divisors, since everything
>divides 0, and otherwise an integer never divides

>a smaller integer, for this purpose, 0 is the
>greatest common divisor of 0 and 0.

You're justifying an exception to the name GCD by pointing out that 0 has other special properties. Sure, we could define gcd(0,0)=0 or we could leave it undefined. You can make the case for either one. From my point of view the G in GCD says it all. No need to confuse things unless there's a strong reason.

One way or the other, it's an exception −− either it's not defined so that's an exception, or it is defined, but in an exceptional way. So in a sense the choice is arbitrary, but there are tradeoffs to be weighed. However, you don't get to decide the issue yourself if there's already a consensus. Let's check respected texts on Number Theory and see what side of this argument they take, If most or perhaps nearly all of them define gcd(0,0) undefined, you are just causing trouble to insist otherwise.

> The ordering is that of divisibility.

So you proclaim.

>This also holds for least common multiple.

LCM doesn't need to be undefined.

0 is multiple of 0, so LCM(0,0)=0 is just fine.

0 is not a divisor of 0.

If you don't believe it, let's see what the books have to say.

quasi
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- ***Follow−Ups***:
  - ***Re: GCD(0,0)***
    - *From:* David C . Ullrich
  - ***Re: GCD(0,0)***
    - *From:* quasi
- ***References***:
  - ***GCD(0,0)***
    - *From:* Leroy Quet
  - ***Re: GCD(0,0)***
    - *From:* Herman Rubin
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