Re: GCD(0,0)

Source: http://sci.tech−archive.net/Archive/sci.math/2005−12/msg05249.html

- *From*: David C. Ullrich <ullrich@xxxxxxxxxxxxxxx>
- *Date*: Fri, 30 Dec 2005 06:13:20 −0600

On Thu, 29 Dec 2005 20:58:08 −0500, quasi <quasi@xxxxxxxx> wrote:

>On 29 Dec 2005 19:59:26 −0500, hrubin@xxxxxxxxxxxxxxxxxxx (Herman
>Rubin) wrote:
>
>>In article <1135888209.029280.145500@xxxxxxxxxxxxxxxxxxxxxxxxxxxxx>,
>>Leroy Quet <qqquet@xxxxxxxxxxxxx> 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.

A strong reason to want a definition of GCD(0,0) is so we
don't have to worry about whether x and y are both 0 when
we mention GCD(0,0). Since that standard definition is in
all other cases precisely equivalent to the one given above
it seems like a very natural definition.

To put the same point another way: Read the rest of the
thread, in particular the post by JoeS. The notion of
GCD generalizes in a perfectly natural way to an
arbitrary PID. But the definition that works in a PID
is equivalent to the definition