Re: Sign conventions

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From: Jim Spriggs (*jim.sprigs_at_ANTISPAMbtinternet.com.invalid*)
Date: 03/03/05

Date: Thu, 3 Mar 2005 14:34:21 +0000 (UTC)

Kevin wrote:
>
> On Sun, 20 Feb 2005 18:14:14 −0700
> "Luc The Perverse" <sll_NOSPAM_zm@remove.cc.usu.edu> wrote:
>
> > <stephen@nomail.com> wrote in message
> > news:cvb16c$20jb$3@msunews.cl.msu.edu...
> > > In sci.math Luc The Perverse
> > > <sll_NOSPAM_zm@remove.cc.usu.edu> wrote::
> > > <matt271829−news@yahoo.co.uk> wrote in message:
> > > news:1108844262.006262.325240@g14g2000cwa.googlegroups.com..
> > > .:> I am not disagreeing with you... it does, at least for
> > > positive x. (The:> situation for negative x is less clear to
> > > me, but since we can't:> algebraically distinguish between i
> > > and −i anyway maybe this is a:> non−question!)
> > >
> > >
> > > : i is the positive square root of −1 by definition.
> > > Problem solved.
> > >
> > > Is i > 0 ? :)
> >
> > I admit you have me bothered.
> >
> > I will say that |i|>0 however. There is a nagging part of me
> > which says that both −i and i are negative.
> >
> > Is the problem supposed to be common knoweldge. I never
> > remember it discussed in school.
>
> I learned that the complex numbers aren't ordered (or well
> ordered, I don't know the difference actually),

It's true that the complex numbers aren't well ordered, but that's not germane because the real numbers aren't either. A set is said to be well ordered if every non−empty subset has a minimal element. For example the natural numbers are well ordered, the positive rationals aren't.

The relevant order is that of an "ordered field". So, in addition to the other axioms for a field, we have

(1) For all x, y, one and only one of

$x > y, x = y, x < y$

holds.

(2) For all x, y, z

if $x > y$ and $y > z$ then $x > z$.

(3) For all x, y, z

if $x > y$ then $x + z > y + z$.

(4) For all x, y, z

if $x > y$ and $z > 0$ then $xz > yz$.

It is these rules that the complex numbers don't satisfy.

> but anyway, I
> thought I learned that you can't order complex numbers,

You did.

> so i > 0
> is nonsense.

You're right.