

# Re: Defining "<" for the rationals

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Bill Dubuque schrieb:

Michael Stemper <mstemper@xxxxxxxxxxxxxxxxxxxx> wrote:

I've been looking at the rational numbers as an equivalence relation. I've been able to show that the definitions of multiplication and addition give the same answer, regardless of which member of an equivalence set is chosen. I wanted to also define the "<" relation, but hit a stumbling block. Most of the time, you can say  $(a,b) < (c,d)$  iff  $ad < bc$ . However, this falls apart if  $b$  or  $d$  is negative.

You may use  $a/b < c/d \iff ad < bc$

Oh well, I always like your fine comments. My signum function solution was correct but cumbersome.  $bd = |bd| * \text{signum}(bd)$  and  $|bd| > 0$  allow the simplification of my suggestion

$[(a,b)] < [(c,d)] \iff \text{signum}(bd) * ad < \text{signum}(bd) * bc$

by multiplying both sides of the inequality with factor  $|bd|$ , yielding your elegant solution.

My best regards to you,  
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