

Re: Defining "<" for the rationals

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Michael Stemper 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.

I could say "chose a member of $[(a,b)]$ with a positive second element," or I could say "if $b < 0$, change the signs of a and b ." Neither of these seem particularly elegant. Is there a cleaner way to define the less than relation on rationals?

$p < q$ iff $q - p$ is positive.

$[(a,b)]$ is positive iff $a b$ is.

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