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**From:** jeffrey E. <jeevacation@gmail.com>  
**Sent:** Monday, December 4, 2017 1:55 PM  
**To:** Misha Gromov  
**Subject:** Re:

similar to what does it mean to have an ordinal. =A0 an ordinal in your language is the "understood object" = you take the sets of all things that are close to it , =multidimensional sets and undergo recursion in order to c=me close the "understood" the narrowest of definition. =A0

On =on, Dec 4, 2017 at 8:24 AM, Misha Gromov [REDACTED] wrote=:

Can't say i got it, why "understanding"

On Mon, 4 Dec 2017 07:59:01 -0500, jeffrey E. wrote:

why is transfinite recursion <[https://en.wikipedia.org/wiki/Transfinite\\_recursion](https://en.wikipedia.org/wiki/Transfinite_recursion)> a good= model for understanding – the proof that the result is well-define= uses transfinite induction. Let  $F$  denote a (class) function = to be defined on the ordinals. The idea now is that, in defining  $F(\alpha)$  for an unspecified ordinal  $\alpha$ , one may assume that  $F(\beta)$  is already defined for all  $\beta < \alpha$  and thus give a formula for  $F(\alpha)$  in terms of these  $F(\beta)$ . It then follows by tra=nsfinite induction that there is one and only one function satisfying the r=cursion formula up to and including  $\alpha$ .

(more will be given later): define function  $F$  by letting  $F(\alpha)$  be the smallest ordinal not in the set  $\{F(\beta) \mid \beta < \alpha\}$  = that is, the set consisting of all  $F(\beta)$  for  $\beta < \alpha$ . This definiti=n assumes the  $F(\beta)$  known in the very process of defining ; this apparent vicious circle is exactly what definition by transfi=ite recursion permits. In fact,  $F(0)$  makes sense since there is n= ordinal  $\beta < 0$  =pan>, and the set  $\{F(\beta) \mid \beta < 0\}$  is empty. So  $F(0)$  is equal t= 0 (the smallest ordinal of all). Now that  $F(0)$  is known, the def=inition applied to  $F(1)$  makes sense (it is the smallest ordinal no= in the singleton set  $\{<=m>F(0)\} = \{0\}$ ), and so on .

it sort of says an approximation to truth. by reduction. alt=rnately we can add other dimensions.

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