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Charles N. Delzell* (delzell@math.lsu.edu), Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803. *A new, simpler finitary construction of the real closure of a discrete ordered field.* Preliminary report.

We give a new, simple, finitary construction of the real closure R of a discrete (roughly, computable) ordered field (K, \geq) , as the set of equivalence classes of (ι -terms involving) uniquely satisfiable formulae with one free variable in the first-order language of ordered rings $(+, -, \cdot, 0, 1, \geq)$ with equality, augmented by a constant symbol c_r for each element $r \in K$. It is routine to verify, finitarily, that this R satisfies the axioms of real closed, ordered fields, with the exception of the axiom $0 \neq 1$, for which the verification is difficult, and depends on (and is equivalent to) a finitary proof of the consistency of the theory of real closed ordered fields augmented by the (atomic) diagram of (K, \geq) . (Received February 03, 2009)