

Algebraic extensions of semirings

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Dear all,

I am interested in algebraic extensions of commutative semirings. Can somebody tell me why the literature almost exclusively seems to deal with algebraic extensions of fields? What's so special about them? We can write down polynomials over loads of other structures.

In particular, I'm interested in the semiring of pairs of positive real numbers (a,b) with $a \leq b$, with multiplication and addition performed elementwise. What would an algebraic extension of this produce? Presumably it would give a ring, as we require the polynomials $x+(a,b)=0$ to have a solution. Unfortunately, I really do want a ring, not a semiring --- is there any natural way to weaken the notion of algebraic extension so that semirings aren't turned into rings? Or perhaps, I have completely the wrong end of the stick here, in which case, I'd be glad for somebody to correct me.

Regards,
Jamie.

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