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1. *Assignment*
 - a. Continue formulating questions about the paper we're outlining in class.
 - b. Consider whether and when you might like to discuss material you're working on.
 - c. Continue formulating questions about the social organization of mathematics.
 2. *Events*. The date for the "social" I announced will be at my house, Wednesday 27 February, 6 to about 8 PM. See you there!
 3. *In-class outline*. We considered the question of further generalization of the scalars.
 - a. We agreed that although some of these results can be generalized to apply to modules over rings, where the scalars could be integers, integers modulo a nonprime, or even polynomials, that theory diverges considerably from standard linear algebra.
 - b. I noted that noncommutative scalars can be accommodated, provided determinants are left out of the mix. Some of the fundamental results you learn about determinants don't work with noncommutative scalars, and I don't think it's clear even now exactly what results should take their place.
 - c. I also noted that scalars with finite characteristic are okay, except that again, some fundamental results about determinants fail for characteristic 2.
 - d. I suspect this means we should follow Axler's lead: *Down with Determinants!*
 4. *Current state of the outline*
 - a. Introduction
 - b. ??Should we explain the basics?
 - c. Every vector space has a basis.
 - d. Rank & nullity theorem
 - e. Extension of the theory to infinite-dimensional cases
 - f. ??What features of the definition of "vector space" are really required for this theory?
 - i. We can accommodate fields, perhaps noncommutative, of any characteristic. We don't want to do modules over rings.
 - g. References

Baer, Reinhold. 1952. *Linear Algebra and Projective Geometry*. Pure and applied mathematics, 2. New York: Academic Press. [Cited in ??.]
 5. *Lemmas, propositions, theorems*. Someone asked what's the difference?
 - a. Lemmas are usually uninteresting in themselves. If you see an argument repeated with minor variation in a proof, you might want to formulate it as a lemma with a separate proof, so that you can refer to it in a single line instead of repeating it.
 - b. Sometimes a lemma acquires great interest *a posteriori*, though: for example, Zorn's. It's due not to Zorn but to Hausdorff and Kuratowski. But Zorn used it particularly effectively.

- c. Sometimes a result is a compendium of a bunch of steps that each require rather independent proofs. In that case it's sometimes called a theorem, while the constituent parts are enunciated as propositions.
- d. But in other contexts, *proposition* may merely mean the meaning of some sentence.
- e. There's no standard, but an author should be consistent within a single work, else be guilty of suggesting distinctions where there are none.