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Prolegomena to singular valuations

Singular valuations of rank $n > 1$ are like classical valuations, except that some elements (the singular elements) can have a value with an infinite component (where we view the value group embedded in \bar{R}^n , with \bar{R} the ordered semi-group of the reals with infinity). Such valuations arise when taking limits of classical valuations. A typical example is given by the total blow-up along a valuation. To a singular valuation, one can associate a valuation ring (which only captures the non-singular part), and a local subring, its "singularization" ring. The properties of the latter are still mysterious. For instance, there can be up to $2n$ prime valuation ideals. This work is still in its preliminary stages, and I will mostly present some examples.