



Grassmann Algebra Volume 1: Foundations: Exploring Extended Vector Algebra with Mathematica (Paperback)

By John Browne

Createspace, United States, 2012. Paperback. Book Condition: New. 254 x 176 mm. Language: English . Brand New Book ***** Print on Demand *****. Grassmann Algebra Volume 1: Foundations Exploring extended vector algebra with Mathematica Grassmann algebra extends vector algebra by introducing the exterior product to algebraicize the notion of linear dependence. With it, vectors may be extended to higher-grade entities: bivectors, trivectors, . multivectors. The extensive exterior product also has a regressive dual: the regressive product. The pair behaves a little like the Boolean duals of union and intersection. By interpreting one of the elements of the vector space as an origin point, points can be defined, and the exterior product can extend points into higher-grade located entities from which lines, planes and multiplanes can be defined. Theorems of Projective Geometry are simply formulae involving these entities and the dual products. By introducing the (orthogonal) complement operation, the scalar product of vectors may be extended to the interior product of multivectors, which in this more general case may no longer result in a scalar. The notion of the magnitude of vectors is extended to the magnitude of multivectors: for example, the magnitude of the exterior product of two vectors (a bivector)...

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