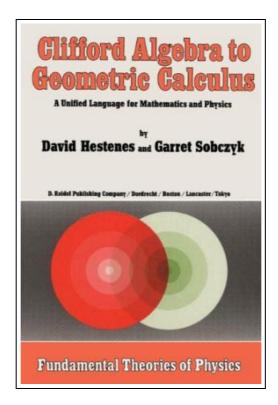
# Clifford Algebra to Geometric Calculus



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Condition: New. Publisher/Verlag: Springer Netherlands | A Unified Language for Mathematics and Physics | Matrix algebra has been called "the arithmetic of higher mathematics" [Be]. We think the basis for a better arithmetic has long been available, but its versatility has hardly been appreciated, and it has not yet been integrated into the mainstream of mathematics. We refer to the system commonly called 'Clifford Algebra', though we prefer the name 'Geometric Algebm' suggested by Clifford himself. Many distinct algebraic systems have been adapted or developed to express geometric relations and describe geometric structures. Especially notable are those algebras which have been used for this purpose in physics, in particular, the system of complex numbers, the quaternions, matrix algebra, vector, tensor and spinor algebras and the algebra of differential forms. Each of these geometric algebras has some significant advantage over the others in certain applications, so no one of them provides an adequate algebraic structure for all purposes of geometry and physics. At the same time, the algebras overlap considerably, so they provide several different mathematical representations for individual geometrical or physical ideas. | 1 / Geometric Algebra.- 1-1. Axioms, Definitions and Identities.- 1-2. Vector Spaces, Pseudoscalars and Projections.- 1-3. Frames and Matrices.- 1-4. Alternating Forms and Determinants.- 1-5. Geometric Algebras of PseudoEuclidean Spaces.- 2 / Differentiation.- 2-1. Differentiation by Vectors.- 2-2. Multivector Derivative, Differential and Adjoints. - 2-3. Factorization and Simplicial Derivatives. - 3 / Linear and Multilinear Functions. - 3-1. Linear Transformations and Outermorphisms.- 3-2. Characteristic Multivectors and the Cayley-Hamilton Theorem.- 3-3. Eigenblades and Invariant Spaces.- 3-4. Symmetric and Skew-symmetric Transformations.- 3-5. Normal and Orthogonal Transformations.- 3-6. Canonical Forms for General Linear Transformations.-3-7. Metric Tensors and Isometries.- 3-8. Isometries and Spinors of PseudoEuclidean Spaces.- 3-9. Linear Multivector Functions.- 3-10. Tensors.- 4 / Calculus on Vector Manifolds.- 4-1. Vector Manifolds.- 4-2. Projection,...



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