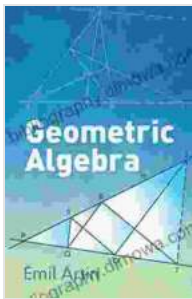


Geometric Algebra Dover On Mathematics: An Intellectual Odyssey

Geometric algebra is a powerful mathematical tool that has applications in a wide range of fields, including mathematics, physics, engineering, and computer science. It is based on the idea of representing objects in space as vectors, and then using the rules of algebra to perform operations on those vectors.

The book *Geometric Algebra Dover On Mathematics* by Dorje Brody and Sibylle Schroll is a comprehensive to geometric algebra. The book covers the basics of geometric algebra, including the vector space model, the geometric product, and the exterior product. It also covers more advanced topics, such as Clifford algebras, spinors, and quaternions.



Geometric Algebra (Dover Books on Mathematics)

by Emil Artin

★★★★☆ 4.2 out of 5

Language : English
File size : 17364 KB
Text-to-Speech : Enabled
Enhanced typesetting : Enabled
Print length : 228 pages
Lending : Enabled
Screen Reader : Supported

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The book is written in a clear and concise style, and it is packed with examples and exercises. It is a valuable resource for anyone who wants to

learn more about geometric algebra.

Vector Space Model

The vector space model is the foundation of geometric algebra. In the vector space model, objects in space are represented as vectors. A vector is a quantity that has both magnitude and direction. The magnitude of a vector is its length, and the direction of a vector is the direction in which it points.

Vectors can be added and subtracted using the rules of vector addition and subtraction. They can also be multiplied by scalars, which are numbers. The scalar product of two vectors is a number, and the vector product of two vectors is a vector.

Geometric Product

The geometric product is a binary operation on vectors that is defined as follows:

$$a \cdot b = +$$

The scalar part of the geometric product is the dot product of the two vectors. The vector part of the geometric product is a vector that is perpendicular to both of the original vectors.

The geometric product is a powerful tool that can be used to perform a variety of operations on vectors. For example, the geometric product can be used to calculate the area of a parallelogram, the volume of a parallelepiped, and the dot product of two vectors.

Exterior Product

The exterior product is a binary operation on vectors that is defined as follows:

$$a \wedge b =$$

The exterior product of two vectors is a vector that is perpendicular to both of the original vectors. The exterior product is a powerful tool that can be used to perform a variety of operations on vectors. For example, the exterior product can be used to calculate the cross product of two vectors, the area of a triangle, and the volume of a tetrahedron.

Clifford Algebras

Clifford algebras are generalizations of geometric algebra. Clifford algebras are defined over a field, and they include the field as a subalgebra. Clifford algebras are used in a variety of applications, including physics, engineering, and computer science.

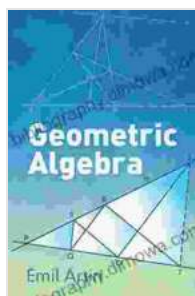
Spinors

Spinors are objects that are used to represent the spin of particles. Spinors are elements of a Clifford algebra, and they can be used to describe the spin of particles in a variety of physical systems.

Quaternions

Quaternions are a type of Clifford algebra that is used to represent rotations in three-dimensional space. Quaternions are widely used in computer graphics and robotics.

Geometric algebra is a powerful mathematical tool that has applications in a wide range of fields. The book *Geometric Algebra Dover On Mathematics* by Dorje Brody and Sibylle Schroll is a comprehensive to geometric algebra. The book is written in a clear and concise style, and it is packed with examples and exercises. It is a valuable resource for anyone who wants to learn more about geometric algebra.



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