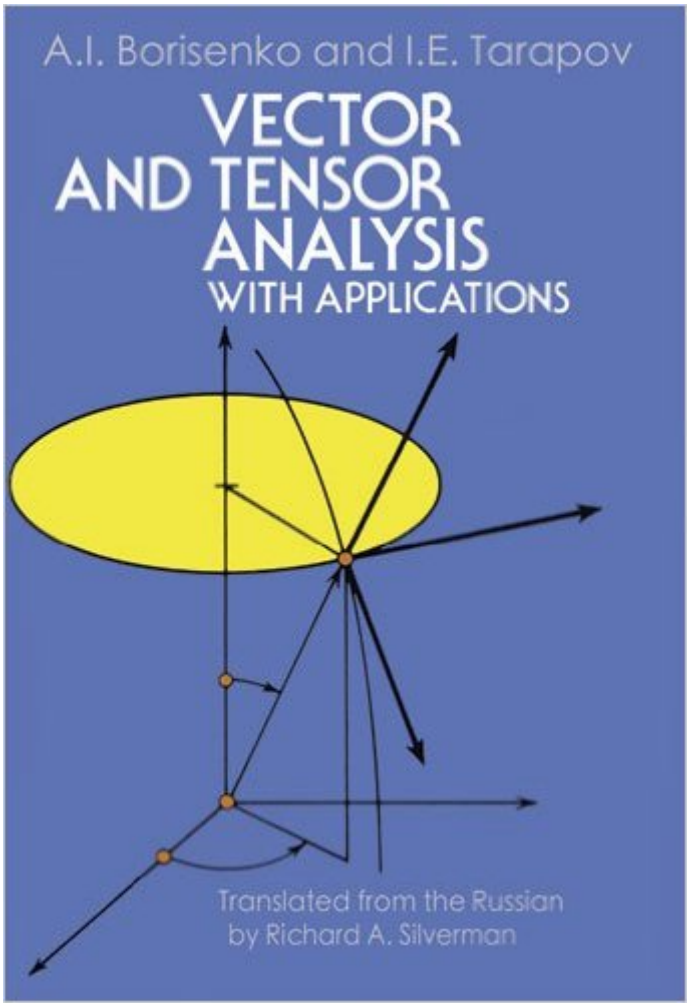
Vector And Tensor Analysis With Applications (Dover Books On Mathematics)



Synopsis

Concise andÂ readable, this text ranges from definition of vectors and discussion of algebraic operations on vectors to the concept of tensor and algebraic operations on tensors. It alsoÂ includes a systematic study of the differential and integral calculus of vector and tensor functions of space and time. Worked-out problems and solutions. 1968 edition.

Book Information

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Customer Reviews

I was first exposed to tensors in college, and the experience was so unpleasant and bewildering that I switched to quantum mechanics. QM made sense to me; tensors did not.Decades later, I had a real need for tensors in my job, so I had to learn them. I bought and read a half-dozen well-rated books from , but only this book worked. The exposition is mathematically rigorous, but the content is also well-motivated. Their explanation of "The Tensor Concept" is the subject of a dedicated chapter; it alone is worth the price of the book. Its presentation encapsulates the book’s style, so I’ll preview it here.A standard, one-dimensional vector is a ray in space, with direction and length independent of the coordinate system. As the coordinate system changes (e.g. rotate and/or stretch the axes), the coordinate values change, but the vector is the same. (Indeed, that’s how you figure out the new coordinate values!)The most simple example of mapping one vector into another is multiplication by a two dimensional matrix. Here is the golden insight: if the input and output vectors are coordinate independent, then there must be some kind of coordinate-independent function that

defines the mapping, and it is called a tensor. In short, a mixed rank-2 tensor is the coordinate independent version of a matrix.They work through the transformation rules of a standard vector to establish notation, then work through the exact corresponding process to get the transformation rules for the matrix. Instead of just asserting that "A Tensor is something which transforms the following way", they start with the intuitive notion and present a simple derivation of the transformation rule.

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