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Nota di contenuto	Contents; Acknowledgments; Introduction; 1. Introduction; 1.1 Why Would I Have Valued This Book in High School?; 1.2 Who Else Would Value This Book?; 1.3 Physics & Biology; 1.4 Motivation; 1.5 The Principle of Least Thought .; 1.6 Measurement; 1.7 Conceptual Blending; 1.8 Mental Model of Muscle Contraction; 1.9 Organization; 1.10 What is Missing?; 1.11 What is Original?; Mathematics; 2. Ground & Foundation of Mathematics; 2.1 Introduction; 2.2 Ground: Discourse & Surface; 2.2.1 Symbol & Expression; 2.2.2 Substitution & Rearrangement; 2.2.3 Diagrams Rule by Diagram Rules; 2.2.4 Dot & Arrow 2.3 Foundation: Category & Functor2.3.1 Category; 2.3.2 Functor; 2.3.3 Isomorphism; 2.4 Examples of Categories & Functors; 2.4.1 Finite Set; 2.4.2 Set; 2.4.3 Exponentiation of Sets; 2.4.4 Pointed Set; 2.4.5 Directed Graph; 2.4.6 Dynamic System; 2.4.7 Initialized Dynamic System; 2.4.8 Magma; 2.4.9 Semigroup; 2.4.10 Monoid; 2.4.11 Group; 2.4.12 Commutative Group; 2.4.13 Ring; 2.4.14 Field; 2.4.15 Vector Space over a Field; 2.4.16 Ordered Field; 2.4.17 Topology; 2.5

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2.5.3 Category Constructed from a Topological Space3. Calculus as an Algebra of Infinitesimals; 3.1 Real & Hyperreal; 3.2 Variable; 3.2.1 Computer Program Variable; 3.2.2 Mathematical Variable; 3.2.3 Physical Variable; 3.3 Right, Left & Two-Sided Limit; 3.4 Continuity; 3.5 Differentiable, Derivative & Differential; 3.5.1 Partial Derivative; 3.6 Curve Sketching Reminder; 3.7 Integrability; 3.8 Algebraic Rules for Calculus; 3.8.1 Fundamental Rule; 3.8.2 Constant Rule; 3.8.3 Addition Rule; 3.8.4 Product Rule; 3.8.5 Scalar Product Rule; 3.8.6 Chain Rule; 3.8.7 Exponential Rule
3.8.8 Change-of-Variable Rule3.8.9 Increment Rule; 3.8.10 Quotient Rule; 3.8.11 Intermediate Value Rule; 3.8.12 Mean Value Rule; 3.8.13 Monotonicity Rule; 3.8.14 Inversion Rule; 3.8.15 Cyclic Rule; 3.8.16 Homogeneity Rule; 3.9 Three Gaussian Integrals; 3.10 Three Differential Equations; 3.11 Legendre Transform; 3.12 Lagrange Multiplier; 4. Algebra of Vectors; 4.1 Introduction; 4.2 When is an Array a Matrix?; 4.3 List Algebra; 4.3.1 Abstract Row List; 4.3.2 Set of Row Lists; 4.3.3 Inclusion of Row Lists; 4.3.4 Projection of Row Lists; 4.3.5 Row List Algebra; 4.3.6 Monoid Constructed from a Set
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4.5.8 The Vector Space of Matrices

Sommario/riassunto

This unprecedented book offers all the details of the mathematical mechanics underlying modern modeling of skeletal muscle contraction. The aim is to provide an integrated vision of mathematics, physics, chemistry and biology for this one understanding. T