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7.3. Generating Products of Variables of Desired Dimension 7.4. Number of Independent Sets of Products of Given Dimension (I); 7.5. Completeness of the Set of Products of Variables; 7.6. Special Case: Matrix A is Singular; 7.7. Number of Independent Sets of Products of Given Dimension (II); Buckingham's Theorem; 7.8. Selectable and Nonselectable Dimensions in a Product of Variables; 7.9. Minimum Number of Independent Products of Variables of Given Dimension; 7.10. Constancy of the Sole Dimensionless Product; 7.11. Number of Dimensions Equals or Exceeds the Number of Variables; 7.12. Problems Chapter 8. Systematic Determination of Complete Set of Products of Variables 8.1. Dimensional Set; Derivation of Products of Variables of a Given Dimension; 8.2. Checking the Results; 8.3. The Fundamental Formula; Chapter 9. Transformations; 9.1. Theorems Related to Some Specific Transformations; 9.2. Transformation Between Systems of Different Matrices; 9.3. Transformation Between Dimensional Sets; 9.4. Independence of Dimensionless Products of the Dimensional System Used; Chapter 10. Number of Sets of Dimensionless Products of Variables; 10.1. Distinct and Equivalent Sets 10.2. Changes in a Dimensional Set Not Affecting the Dimensionless Variables 10.3. Prohibited Changes in a Dimensional Set; 10.4. Number of Distinct Sets; 10.5. Exceptions; 10.6. Problems; Chapter 11. Relevancy of Variables; 11.1. Dimensional Irrelevancy; 11.2. Physical Irrelevancy; 11.3. Problems; Chapter 12. Economy of Graphical Presentation; 12.1. Number of Curves and Charts; 12.2. Problems; Chapter 13. Forms of Dimensionless Relations; 13.1. General Classification; 13.2. Monomial is Mandatory; 13.3. Monomial is Impossible-Proven; 13.4. Monomial is Impossible- Not Proven 13.5. Reconstructions

Sommario/riassunto

Applied Dimensional Analysis and Modeling provides the full mathematical background and step-by-step procedures for employing dimensional analyses, along with a wide range of applications to problems in engineering and applied science, such as fluid dynamics, heat flow, electromagnetics, astronomy and economics. This new edition offers additional worked-out examples in mechanics, physics, geometry, hydrodynamics, and biometry.* Covers 4 essential aspects and applications: - principal characteristics of dimensional systems - applications of dimensional techniques in engine