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Transmission through a Circular Shaft; Problems; 5. Simple Frames; Problems; 6. Indeterminate Truss; 6.1 Equilibrium Equations; 6.2 Deformation Displacement Relations; 6.3 Force Deformation Relations; 6.4 Compatibility Conditions; 6.5 Initial Deformation and Support Settling
6.6 Null Property of the Equilibrium Equation and Compatibility Condition Matrices 6.7 Response Variables of Analysis; 6.8 Method of Forces or the Force Method; 6.9 Method of Displacements or the Displacement Method; 6.10 Integrated Force Method; Procedures for Analysis; Theory of Dual Integrated Force Method; Theory of Stiffness Method; Stiffness Method for Thermal Load; First Thermal Load; Second Thermal Load; Stiffness Method for Support Settling; Problems; 7. Indeterminate Beam; 7.1 Internal Forces in a Beam; 7.2 IFM Analysis for Indeterminate Beam; 7.3 Flexibility Matrix
7.4 Stiffness Method Analysis for Indeterminate Beam 7.5 Stiffness Method for Mechanical Load; 7.6 Stiffness Solution for Thermal Load; 7.7 Stiffness Solution for Support Settling; 7.8 Stiffness Method Solution to the Propped Beam; 7.9 IFM Solution to Example 7-5; 7.10 Stiffness Method Solution to Example 7-5; Problems; 8. Indeterminate Shaft; 8.1 Equilibrium Equations; 8.2 Deformation Displacement Relations; 8.3 Force Deformation Relations; 8.4 Compatibility Conditions; 8.5 Integrated Force Method for Shaft; 8.6 Stiffness Method Analysis for Shaft; Problems; 9. Indeterminate Frame
9.1 Integrated Force Method for Frame Analysis

Sommario/riassunto

Strength of Materials provides a comprehensive overview of the latest theory of strength of materials. The unified theory presented in this book is developed around three concepts: Hooke's Law, Equilibrium Equations, and Compatibility conditions. The first two of these methods have been fully understood, but clearly are indirect methods with limitations. Through research, the authors have come to understand compatibility conditions, which, until now, had remained in an immature state of development. This method, the Integrated Force Method (IFM) couples equilibrium and compatibility conditions