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Autore	Rathakrishnan Ethirajan
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2.7.3 Transition Point; 2.7.4 Separation Point; 2.7.5 Rotational and Irrotational Motion; 2.8 Streamlines; 2.8.1 Relationship between Stream Function and Velocity Potential; 2.9 Potential Flow; 2.9.1 Two-dimensional Source and Sink; 2.9.2 Simple Vortex; 2.9.3 Source-Sink Pair; 2.9.4 Doublet; 2.10 Combination of Simple Flows; 2.10.1 Flow Past a Half-Body; 2.11 Flow Past a Circular Cylinder without Circulation; 2.11.1 Flow Past a Circular Cylinder with Circulation; 2.12 Viscous Flows; 2.12.1 Drag of Bodies; 2.12.2 Turbulence; 2.12.3 Flow through Pipes; 2.13 Compressible Flows; 2.13.1 Perfect Gas; 2.13.2 Velocity of Sound; 2.13.3 Mach Number; 2.13.4 Flow with Area Change; 2.13.5 Normal Shock Relations; 2.13.6 Oblique Shock Relations; 2.13.7 Flow with Friction; 2.13.8 Flow with Simple T0-Change; 2.14 Summary; Exercise Problems; References; 3 Conformal Transformation; 3.1 Introduction; 3.2 Basic Principles; 3.2.1 Length Ratios between the Corresponding Elements in the Physical and Transformed Planes; 3.2.2 Velocity Ratios between the Corresponding Elements in the Physical and Transformed Planes; 3.2.3 Singularities; 3.3 Complex Numbers; 3.3.1 Differentiation of a Complex Function; 3.4 Summary; Exercise Problems; 4 Transformation of Flow Pattern; 4.1 Introduction; 4.2 Methods for Performing Transformation; 4.2.1 By Analytical Means; 4.3 Examples of Simple Transformation; 4.4 Kutta-Joukowski Transformation; 4.5 Transformation of Circle to Straight Line; 4.6 Transformation of Circle to Ellipse; 4.7 Transformation of Circle to Symmetrical Aerofoil; 4.7.1 Thickness to Chord Ratio of Symmetrical Aerofoil; 4.7.2 Shape of the Trailing Edge; 4.8 Transformation of a Circle to a Cambered Aerofoil; 4.8.1 Thickness-to-Chord Ratio of the Cambered Aerofoil; 4.8.2 Camber; 4.9 Transformation of Circle to Circular Arc

Sommario/riassunto

Theoretical Aerodynamics is a user-friendly text for a full course on theoretical aerodynamics. The author systematically introduces aerofoil theory, its design features and performance aspects, beginning with the basics required, and then gradually proceeding to higher level. The mathematics involved is presented so that it can be followed comfortably, even by those who are not strong in mathematics. The examples are designed to fix the theory studied in an effective manner. Throughout
