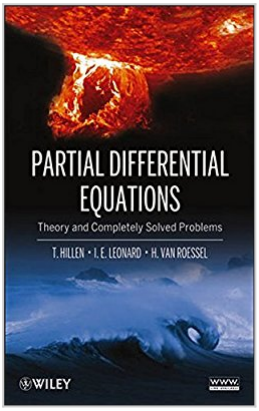

Partial Differential Equations: Theory and Completely Solved Problems

By Thomas Hillen, I. E. Leonard, Henry van Roessel

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Uniquely provides fully solved problems for linear partial differential equations and boundary value problems

Partial Differential Equations: Theory and Completely Solved Problems utilizes real-world physical models alongside essential theoretical concepts. With extensive examples, the book guides readers through the use of Partial Differential Equations (PDEs) for successfully solving and modeling phenomena in engineering, biology, and the applied sciences.

The book focuses exclusively on linear PDEs and how they can be solved using the separation of variables technique. The authors begin by describing functions and their partial derivatives while also defining the concepts of elliptic, parabolic, and hyperbolic PDEs. Following an introduction to basic theory, subsequent chapters explore key topics including:

• Classification of second-order linear PDEs

• Derivation of heat, wave, and Laplace's equations

• Fourier series

• Separation of variables

• Sturm-Liouville theory

• Fourier transforms

Each chapter concludes with summaries that outline key concepts. Readers are provided the opportunity to test their comprehension of the presented material through numerous problems, ranked by their level of complexity, and a related website features supplemental data and resources.

Extensively class-tested to ensure an accessible presentation, *Partial Differential Equations* is an excellent book for engineering, mathematics, and applied science

courses on the topic at the upper-undergraduate and graduate levels.

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Editorial Review

Review

"The book gives a vivid description of the theory for solving linear PDEs. The excellent method, the expensive use of examples, and the overview of the existing solutions make the book very useful for students and for researchers. It is highly recommended." (*Zamm*, 1 November 2014)

"Summing Up: Recommended. Upper-division undergraduates, graduate students, and faculty." (*Choice*, 1 August 2013)

From the Back Cover

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