MATLAB Differential and Integral Calculus

Cesar Perez Lopez

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MATLAB is a high-level language and environment for numerical computation, visualization, and programming. Using MATLAB, you can analyze data, develop algorithms, and create models and applications. The language, tools, and built-in math functions enable you to explore multiple approaches and reach a solution faster than with spreadsheets or traditional programming languages, such as C/C++ or Java.

MATLAB Differential and Integral Calculus introduces you to the MATLAB language with practical hands-on instructions and results, allowing you to quickly achieve your goals. In addition to giving a short introduction to the MATLAB environment and MATLAB programming, this book provides all the material needed to work with ease in differential and integral calculus in one and several variables. Among other core topics of calculus, you will use MATLAB to investigate convergence, find limits of sequences and series and, for the purpose of exploring continuity, limits of functions. Various kinds of local approximations of functions are introduced, including Taylor and Laurent series. Symbolic and numerical techniques of differentiation and integration are covered with numerous examples, including applications to finding maxima and minima, areas, arc lengths, surface areas and volumes. You will also see how MATLAB can be used to solve problems in vector calculus and how to solve differential and difference equations.

What you'll learn

• How to use the MATLAB environment

• How to explore convergence and find limits of sequences, series and functions with MATLAB.

• How to investigate the continuity of functions, and produce high quality graphical representations of curves and surfaces.

• How to use MATLAB to differentiate functions, with applications to maxima and minima.

• How to use MATLAB to integrate functions, with applications to finding arc lengths, areas, surface areas and volumes.

• How MATLAB can be used to solve problems in vector calculus.

• How to use MATLAB to solve differential and difference equations.

Who this book is for

This book is for anyone who wants to work in a practical, hands-on manner on calculus problems with MATLAB. You'll already have a core understanding of undergraduate level calculus, and have access to an installed version of MATLAB, but no previous experience of MATLAB is assumed.

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2. Limits and Continuity. One and Several Variables.

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Timothy King:

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Jean Ashburn:

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