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978-0-521-35732-6 - Metric Spaces
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Cambridge Tracts in Mathematics

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No. 57

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University of St Andrews*



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CAMBRIDGE UNIVERSITY PRESS
Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo, Delhi

Cambridge University Press
The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org
Information on this title: www.cambridge.org/9780521047227

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First published 1968
Reprinted with corrections 1972
Reprinted 1979
First paperback edition 1988
Reprinted 1992
Re-issued in this digitally printed version 2008

A catalogue record for this publication is available from the British Library

Library of Congress Catalogue Card Number: 68-18343

ISBN 978-0-521-04722-7 hardback
ISBN 978-0-521-35732-6 paperback

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PREFACE

This book, based on lectures given in the University of St Andrews, is intended to give honours students the background and training necessary before they start to study functional analysis.

There are many books on functional analysis; and some of them seem to go over the preliminaries to the subject far too quickly. The aim here is to provide a more leisurely approach to the theory of the topology of metric spaces, a subject which is not only the basis of functional analysis but also unifies many branches of classical analysis. The applications of the theory in Chapter 8 to problems in classical algebra and analysis show how much can be done without ever defining a normed vector space, a Banach space or a Hilbert space.

The reader is not expected to know much more classical analysis than is contained in Hardy's *Pure Mathematics* or Burkill's *First Course in Mathematical Analysis*. A knowledge of the elements of the theory of uniform convergence is assumed. Analytic functions and Lebesgue integrals are mentioned occasionally; their introduction provides more advanced applications of the theory of metric spaces, but adds nothing to the theory.

I am most grateful to Professor Arthur Erdélyi and to the Editors of the series of Cambridge Mathematical Tracts for their kindly criticisms and suggestions.

E.T.C.

31 March 1967

I wish to thank Mr Frank Gerrish and Professor Edwin Hewitt for many corrections, which have proved invaluable to me in the preparation of the second impression of this book.

E.T.C.

11 December 1971