CAMBRIDGE

Cambridge University Press & Assessment
978-1-009-01766-4 — Mathematics and Explanation
Christopher Pincock
Frontmatter
More Information

Cambridge Elements

Elements in the Philosophy of Mathematics
edited by
Penelope Rush
University of Tasmania
Stewart Shapiro
The Ohio State University

MATHEMATICS AND EXPLANATION

Christopher Pincock
The Ohio State University

CAMBRIDGE UNIVERSITY PRESS

© in this web service Cambridge University Press & Assessment www.cambridge.org

Shaftesbury Road, Cambridge CB2 8EA, United Kingdom

One Liberty Plaza, 20th Floor, New York, NY 10006, USA

477 Williamstown Road, Port Melbourne, VIC 3207, Australia

314–321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre,
New Delhi – 110025, India

103 Penang Road, #05–06/07, Visioncrest Commercial, Singapore 238467

Cambridge University Press is part of Cambridge University Press & Assessment,
a department of the University of Cambridge.

We share the University's mission to contribute to society through the pursuit of
education, learning and research at the highest international levels of excellence.

www.cambridge.org
Information on this title: www.cambridge.org/9781009017664

DOI: 10.1017/9781009039154

© Christopher Pincock 2023

This publication is in copyright. Subject to statutory exception and to the provisions
of relevant collective licensing agreements, no reproduction of any part may take
place without the written permission of Cambridge University Press & Assessment.

First published 2023

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

ISBN 978-1-009-01766-4 Paperback
ISSN 2399-2883 (online)
ISSN 2514-3808 (print)

Cambridge University Press & Assessment has no responsibility for the persistence
or accuracy of URLs for external or third-party internet websites referred to in this
publication and does not guarantee that any content on such websites is, or will
remain, accurate or appropriate.

CAMBRIDGE

Cambridge University Press & Assessment
978-1-009-01766-4 — Mathematics and Explanation
Christopher Pincock
Frontmatter
More Information

Mathematics and Explanation

Elements in the Philosophy of Mathematics

DOI: 10.1017/9781009039154
First published online: April 2023

Christopher Pincock
The Ohio State University

Author for correspondence: Christopher Pincock, pincock.1@osu.edu

Abstract: This Element answers four questions. Can any traditional theory of scientific explanation make sense of the place of mathematics in explanation? If traditional monist theories are inadequate, is there some way to develop a more flexible but still monist approach that will clarify how mathematics can help to explain? What sort of pluralism about explanation is best equipped to clarify how mathematics can help to explain in science and in mathematics itself? Finally, how can the mathematical elements of an explanation be integrated into the physical world? Some of the evidence for a novel scientific posit may be traced to the explanatory power that this posit would afford, were it to exist. Can a similar kind of explanatory evidence be provided for the existence of mathematical objects, and if not, why not?

Keywords: explanation, pluralism, platonism, causation, inference to the best explanation

© Christopher Pincock 2023

ISBNs: 9781009017664 (PB), 9781009039154 (OC)
ISSNs: 2399-2883 (online), 2514-3808 (print)

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-009-01766-4 — Mathematics and Explanation
Christopher Pincock
Frontmatter
More Information

Contents

1 Introduction 1

2 The Challenge to Traditional Theories of Scientific Explanation 2

3 Counterfactual Accounts of Mathematical Explanation 19

4 Explanatory Pluralism 34

5 Autonomy, Indispensability, and Inference to the Best Explanation 57

References 75

© in this web service Cambridge University Press & Assessment www.cambridge.org