

THE MATHEMATICAL ASSOCIATION

The fundamental aim of the Mathematical Association is to promote good methods of mathematical teaching. A member receives each issue of the *Mathematical Gazette* and/or *Mathematics in School* (according to the class of membership chosen), together with Newsletters. Reports are published from time to time and these are normally available to members at a reduced rate. Those interested in becoming members should contact MA Headquarters for information and application forms. The address of the Association Headquarters is **259 London Road, Leicester LE2 3BE, UK (telephone 0116 221 0013)**. The Association should be notified of any change of address. If copies of the Association periodicals fail to reach a member through lack of such notification, duplicate copies can only be supplied at the published price. If change of address is due to a change of appointment, the Association will be glad to be informed. Subscriptions should be submitted to the Treasurer via Headquarters. Correspondence relating to **Teaching Committee** should be addressed to Dr Chris Pritchard. The **Association's Library** is housed in the University Library, Leicester. Views expressed in the *Mathematical Gazette* by authors or advertisers are not necessarily those of the Association.

THE MATHEMATICAL GAZETTE

Editor:

Dr Gerry Leversha,
St Paul's School,
Lonsdale Road,
London SW13 9JT
g.leversha@btinternet.com

Production Editor:

Mr Bill Richardson,
Kintail,
Longmorn,
Elgin IV30 8RJ
wpr3@tutor.open.ac.uk

Problem Corner:

Mr Nick Lord,
Tonbridge School,
Tonbridge,
Kent TN9 1JP
njl@tonbridge-school.org

Reviews Editor:

Dr Martin Griffiths,
School of Education,
University of Manchester, Oxford Road,
Manchester M13 9PL
gazette-reviews@m-a.org.uk

Potential advertisers should send an e-mail to: *advertisingcontroller@m-a.org.uk*

Material for publication should be sent to the Editor.

Books for review should be sent to Martin Griffiths.

Advice to authors of notes and articles.

Study the format of articles in the *Gazette*. Please note the format for references, which should be listed in their order of appearance in an article. MSS should be typed and two copies submitted. (Mathematical expressions may be hand written.) Once an item has been accepted, electronic versions would be very helpful. This edition of the *Gazette* was produced on an Acorn machine using TechWriter and Draw.

CONTENTS (continued)

Notes 94.26 to 94.40 (continued)

Regular polygons with integer coordinates	<i>Jeremy D. King</i>	495
Popularising the ASS pseudo-congruence theorem	<i>Mowaffaq Hajja</i>	499
Wheels within wheels	<i>Victor Bryant and John Duncan</i>	502
Multinomial distributions and knockout tournaments	<i>Martin Griffiths</i>	505
The truth table of the logical implication	<i>Yves Nievergelt</i>	509
An unlikely certainty	<i>Tony Barnard</i>	514
Getting to the centre	<i>Stuart Simons</i>	517

Teaching Notes

Obtaining derivatives of trigonometric functions using mechanics	<i>T. Nigel Lucas</i>	522
A power series graphing challenge	<i>Nick Lord</i>	527

Obituaries

C. W. Kilmister 1924-2010	<i>John R. Silvester</i>	529
William Salisbury Wynne Willson 1932-2010	<i>Tony Gardiner</i>	532

Correspondence		535
-----------------------	--	-----

Feedback		536
-----------------	--	-----

Problem Corner	<i>Nick Lord</i>	544
-----------------------	------------------	-----

Student Problems	<i>Stan Dolan</i>	551
-------------------------	-------------------	-----

Reviews		553
----------------	--	-----

CONTENTS

Articles

Progressing through mathematics	<i>Jane Imrie</i>	386
The perfect cipher	<i>Robert Edward Lewand</i>	401
Codes, not ciphers	<i>John Baylis</i>	412
Forming groups with 4×4 matrices	<i>J. R. Harris</i>	426
The tables of John Wallis and the discovery of his product for π	<i>Thomas J. Osler</i>	430
Eigencircles and associated surfaces	<i>M. J. Englefield and G. E. Farr</i>	438
Mathematical Rugby	<i>Burkard Polster and Marty Ross</i>	450
Notes 94.26 to 94.40		
Computing quadratic fundamental units	<i>Kung-Wei Yang</i>	464
To your hearts' content	<i>Hang Chen and Curtis Cooper</i>	467
The hyperexponential function	<i>Gareth Boreland</i>	473
On two properties of the inverse Hilbert matrix	<i>Jacek Fabrykowski and Thomas Smotzer</i>	476
Ratios of volumes related to the odd extension of a power function	<i>Timothy G. Feeman and Osvaldo Marrero</i>	479
Approximations for π and e	<i>Des MacHale</i>	486
The recursive nature of Euler's formula for harmonic series	<i>Rasul A. Khan</i>	488
Short proofs of Jensen's and Levinson's Inequalities	<i>A. McD. Mercer</i>	492

(The contents are continued inside the back cover.)

Typeset by Bill Richardson

Printed in Great Britain by 4word Ltd, Bristol
ISSN 0025-5572