

## 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*

*Problem Corner:*

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

*Production Editor:*

Mr Bill Richardson,  
Kintail,  
Longmorn,  
Elgin IV30 8RJ  
*W.P.Richardson@open.ac.uk*

*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 95.01 to 95.20 (continued)

A bootstrapping proof of the AM-GM Inequality for three variables	<i>Shailesh A. Shirali</i>	86
The fundamental theorem of calculus implies that of algebra	<i>Panakkal Mathew and Imre Patyi</i>	88
An interesting integral	<i>Michael D. Hirschhorn</i>	90
Accelerating the convergence of some alternating series	<i>Robin Murphy</i>	91
Some divisibility properties of Catalan numbers	<i>Thomas Koshy and Zhenguang Gao</i>	96
Equiangular cyclic and equilateral circumscribed polygons	<i>Michael de Villiers</i>	102
Proofs by dissection of a dodecagon	<i>Andrew K. Jobbings</i>	107
The generalisation of the triplicate ratio circle	<i>C. J. Bradley</i>	110
The golden ratio in conic sections	<i>Chinmoy Kumar Ghosh</i>	113
Normals to the Euler line	<i>J. A. Scott</i>	115
Spurt optimization	<i>C. W. Groetsch</i>	118
Integral inequalities in probability theory	<i>Alan F. Beardon</i>	119
<b>Teaching Notes</b>		
The confusion between inverse and reciprocal functions	<i>Nick Lord</i>	124
Proof without words that $2 < e < 3$	<i>Nick Lord</i>	125
Rays in a right triangle	<i>Peter G. Brown</i>	126
<b>Feedback</b>		128
<b>Problem Corner</b>	<i>Nick Lord</i>	133
<b>Student Problems</b>	<i>Stan Dolan</i>	142
<b>Reviews</b>		144

## CONTENTS

### Articles

Anamorphoscopes – another look at circle inverting mirrors	<i>John Sharp, B. G. Nickel and J. L. Hunt</i>	1
Morphing Lord Brouncker's continued fraction for $\pi$ into the product of Wallis	<i>Thomas J. Osler</i>	17
The hook-length formula and generalised Catalan numbers	<i>Martin Griffiths and Nick Lord</i>	23
Diophantine Steiner triples	<i>Bojan Hvala</i>	31
Euler's parallel oblique-angled diameters	<i>Thomas J. Osler</i>	40
The Morley tricorn – a solid figure constructed from the diagram for Morley's theorem	<i>A. J. MacFarlane</i>	49
The geometry of a stable game	<i>Martin Griffiths</i>	52
<b>Notes 95.01 to 95.20</b>		
The rational distance problem	<i>Roy Barbara</i>	59
Commensurable triangles		61
Geometric enumeration of the rationals between any two rational numbers	<i>Reginald Koo</i>	63
Make your own log table!	<i>C. W. Puritz</i>	66
Measuring the radius of the Earth	<i>W. J. A. Colman</i>	72
The harmonic series revisited	<i>J. A. Scott</i>	77
Series for $\pi$ $\ln k$ and some other mathematical constants	<i>Juan Pla</i>	78
Maximisation/minimisation without calculus	<i>Michael D. Hirschhorn</i>	83

(The contents are continued inside the back cover.)

Typeset by Bill Richardson

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