

## 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,  
15 Maunder Road,  
Hanwell,  
London W7 3PN  
*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:*

Mr Owen Toller,  
St Paul's School,  
Lonsdale Road,  
London SW13 9JT  
*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 the Reviews Editor.

*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 may be submitted electronically, preferably in pdf format, or, if sent by post, should be typed and two copies included. (Mathematical expressions may be hand written.) Please send by e-mail not on floppy discs. This edition of the *Gazette* was produced on an Acorn machine using TechWriter and Draw.

CONTENTS (continued)

**Notes 98.01 to 98.08 (continued)**

Explicit solutions of $\phi(m) = k!$	<i>B. Sury</i>	112
A nested radical for the Euler constant	<i>J. A. Scott</i>	114
Another minimum for the triangle	<i>J. A. Scott</i>	116
The relative size of the squares inscribed in a triangle	<i>Grégoire Nicollier</i>	117
The order of convergence of Newton's Method in special cases	<i>John Michael McNamee</i>	119
The moment of inertia of an elliptical wire	<i>Nick Lord</i>	121

**Teaching Notes**

Prime numbers and the sequences $6n \pm 1$	<i>Nick Lord</i>	126
Areas of Lunes	<i>Michael Sewell</i>	129
'Summing squares' by counting cubes	<i>K. B. Subramaniam</i>	131

**Feedback** 133

**Problem Corner** *Nick Lord* 136

**Student Problems** *Stan Dolan* 143

**Reviews** 147

## CONTENTS

### Articles

Uniqueness of patterns generated by repetition	<i>John Mason</i>	1
Sliding in rough convex bowls	<i>Mark Hennings and Jon Ingram</i>	8
Quadrirangent spheres	<i>Michael Fox</i>	24
Misunderstandings in A-level statistics	<i>Owen Toller</i>	40
Holmes + Moriarty = Mathematics	<i>Thomas Dence</i>	51
Series involving $\zeta(n)$	<i>G. J. O. Jameson</i>	58
Which is bigger? An intriguing 'double alternation'	<i>Takeshi Hokuto and Mitsuhiro Kumano</i>	67
On static equilibrium of a hemispheroid	<i>Subhranil De</i>	73
On the largest outscribed equilateral triangle	<i>Fengming Dong, Dongsheng Zhao and Weng Kin Ho</i>	79
An approximation to the arithmetic-geometric mean	<i>G. J. O. Jameson</i>	85
Some inequalities for $(a + b)^p$ and $(a + b)^p + (a - b)^p$	<i>G. J. O. Jameson</i>	96
<b>Notes 98.01 to 98.08</b>		
On Fibonacci numbers that are factorials	<i>Surajit Rajagopal and Martin Griffiths</i>	104
On integer triangles	<i>Emrys Read</i>	107

(The contents are continued inside the back cover.)

Typeset by Bill Richardson

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