SHORT CIRCUIT

Canberra Mathematical Association Inc.

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NEWS AND COMMENT

As foreshadowed in our last edition, our umbrella organisation AAMT has held a special general meeting to amend its constitution and change its name. The name-change proposal failed, so we keep the name Australian Association of Mathematics Teachers. Other amendments that were needed for corporate legal reasons were accepted.

The Canberra Mathematical Association will hold its **Annual General Meeting** on 12th November at Erindale College. A colourful and nicely designed invitation to the meeting may be found on page 2 of this newsletter. Come along and enjoy some friendly conversation and a good meal.

CMA is putting forward three names of students who will soon have completed year 11 for the 2025 National Mathematics Summer School. At least two of the ACT applicants will get to attend and we can only hope a place will be found for the third. For various reasons the application process was chaotic this year. We hope to do better next time.

This edition of Short Circuit is late and a bit thin because its editor has been away for all of September. The editor indulges in some reflections, on page 2, arising from his five weeks of travel.

MEMBERSHIP

Memberships run from 1 Jan to 31 Dec. each year. Membership forms may be downloaded from the CMA website: http://www.canberramaths.org.au

The several benefits of Membership of CMA may be found on the website.

NEWSLETTER

The CMA newsletter, Short Circuit, is distributed monthly to everyone on our mailing list, free of charge and regardless of membership status.

That you are receiving Short Circuit does not imply that you are a current CMA member but we do encourage you to join.

Short Circuit welcomes all readers.

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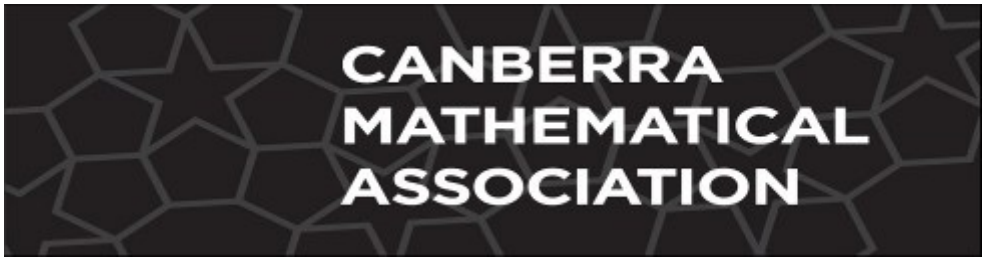


Canberra Mathematical Association Annual General Meeting and Dinner 2024

Date – 12 November 2024

Time – 5.30 Arrival for a 6pm start

Location – Erindale College Restaurant

Cost - $20

Join us to celebrate the year and to recognise some outstanding final year education students from the University of Canberra and the Australian Catholic University.

Tickets available at:
https://www.trybooking.com/CWAIO

DIFFERENCE

At latitude of 55° South it is possible to circumnavigate the earth without encountering land. Such a route takes the traveller between South America and the Antarctic Peninsula. James Cook went this far and beyond, with icy rigging, in storms and extreme cold weather, where few people could or would ever want to live.

Travellers to 55° North and beyond, however, find that human civilisations can and do thrive there. Indeed, some members of the CMA committee have their origins in such places. The weather can be inclement in Edinburgh or Copenhagen or a degree or two to the south in Berlin, but people manage quite nicely. I leave it to the geographers to explain this difference.

Conscious of the need to produce a Short Circuit for October, I was on the lookout for vaguely mathematical or at least educational reflections. Here is one from Manchester.

Alan Turing, famous for his work in Cryptography during WWII and for advances in computer science, among other things, worked for a time at the Victoria University of Manchester. The picture shows a monument to him in which he sits on a park bench holding the apple that poisoned him.

Further down the track, in Copenhagen, I passed by the house where the nuclear physicist Neils Bohr once lived. And the island where astronomer Tycho Brahe worked was not far away. But these are the sorts of things tourists are meant to notice.

Clearly, people can live well in these regions but I began to see hints of differences from place to place in the relative importance placed on the private and the public good, and also pronounced differences in wealth or incomes between individuals.

Begging was evident in some 'rich' countries, as was litter and inadequate garbage collection in some cities. Road surfaces and footpaths were broken up and hazardous in some places but well maintained in others. Anecdotal evidence in Rome suggested that taxes there are so crushingly high that people avoid them through the informal cash economy. As a result the public good suffers.

Rome is a place full of chiesas, basilicas and a great many sacred objects. The pious surface of the place reminded me of a quote that seems to illuminate the public/private, rich/poor dichotomies. It goes, ...*to those that have, more will be given, and from those who have not, even what little they have will be taken away from them*.

Back at home, this statement appears to be accurate with reference to the public/private divide in our education systems, and also with reference to the provision of housing.

The real dichotomy, though, may have more to do with the ways in which this apparently straightforward remark can be interpreted. Some will say it means this is the way things are ordained to be, that personal wealth is a mark of virtue while poverty is evidence of unworthiness and sloth. Others will have a different view, that this iniquitous and obviously unfair state of affairs is all too persistent and should be strenuously resisted.

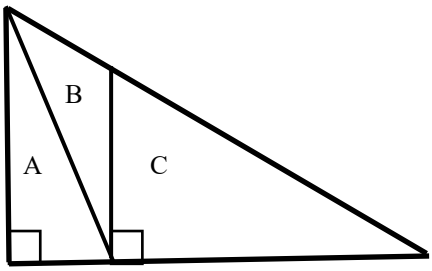
In Rome, I was unable to obtain an ecclesiastical opinion about this dilemma. I suppose those who wish to will work it out for themselves.

Back on the road I observed that the streets of Singapore are free of litter, and the public address system in train carriages says 'mind the gap' at every station. As a bonus, in a street frequented by tourists, there are spheres and colourful icosahedra that light up at night suspended from the trees.

PT

PUZZLE

Three areas



What is A/B – B/C ?

NEWSLETTER OF THE CANBERRA MATHEMATICAL ASSOCIATION INC. INC

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We're on the Web!
http://www.canberramaths.org.au/

ABOUT THE CMA

The Canberra Mathematical Association (Inc.) is the representative body of professional educators of mathematics in Canberra, Australia.
It was established by, among others, the late Professor Bernhard Neumann in 1963. It continues to run - as it began - purely on a volunteer basis.

Its aims include

* the promotion of mathematical education to government through lobbying,
* the development, application and dissemination of mathematical knowledge within Canberra through in-service opportunities, and
* facilitating effective cooperation and collaboration between mathematics teachers and their colleagues in Canberra.

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Theresa Shellshear is CMA's COACTEA representative.

Bruce Ferrington is CMA's AAMT representative.

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http://www.facebook.com/pages/Canberra-Mathematical-Association/110629419011275

PUZZLE SOLUTIONS from Vol 15 No 9

1. Squares in reverse

Observe that $12^2 = 144$ and on reversing the digits, $21^2 = 441$.

The numbers 13 and 31 exhibit the same property with respect to their squares and these are not the only ones. Try 112 and 113. Can you find any others?

A further example is, $122^2 = 14884$ while $221^2 = 48841$. Consider what digits would make the procedure fail.

2. Uncommon thought

For which real values of b do the equations
$x^3 - bx^2 + 2b = 0$ and
$bx^4 - b^2x^3 + x^2 + 2b^2x - b^2 = 0$
have a common root? Find all possible answers.

We submitted this question to an upgraded version of an AI app that is designed to be logical as well as knowledgeable. It solved the first equation for b then made a substitution into the second equation. After some algebraic manipulation it got the correct answer. It is also possible to use a graphical method.

Another approach is to observe that if two polynomial equations have common roots then any multiples and sums or differences of the equations will also share the same roots. Thus, if the first equation is multiplied by bx it becomes $bx^4 - b^2x^3 + 2b^2x = 0$, and this must have the same roots as the second equation. When it is subtracted from the second equation we have $x^2 - b^2 = 0$ and therefore the common roots occur when $x = b$ or $x = -b$.

Substituting these values for x in the first equation we find $b = 0$ or $b = \pm 1$.