SHORT CIRCUIT

Canberra Mathematical Association Inc.

VOLUME 17 NUMBER 7 JULY 2026

NEWS AND COMMENT

Full marks to AAMT CEO Allan Dougan for his piece published in the Sydney Morning Herald denouncing the Myer chain and the Australian brand Lioness for advertising and selling a women's T-shirt with the slogan 'I'm too pretty to do math'.

Allan's thoughtful SMH article is behind a paywall. So, Short Circuit has reprinted it on page 6.

Elsewhere in this edition, readers will find notices of events, pointers to interesting things to read, puzzles and a solution, competitions for students, and research requests.
Enjoy!

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.

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

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CANBERRA MATHEMATICAL ASSOCIATION

INDUSTRY DAY FOR TEACHERS

From the Australian Mathematical Sciences Institute's Marketing and Communications Coordinator, Robbie Byrne:

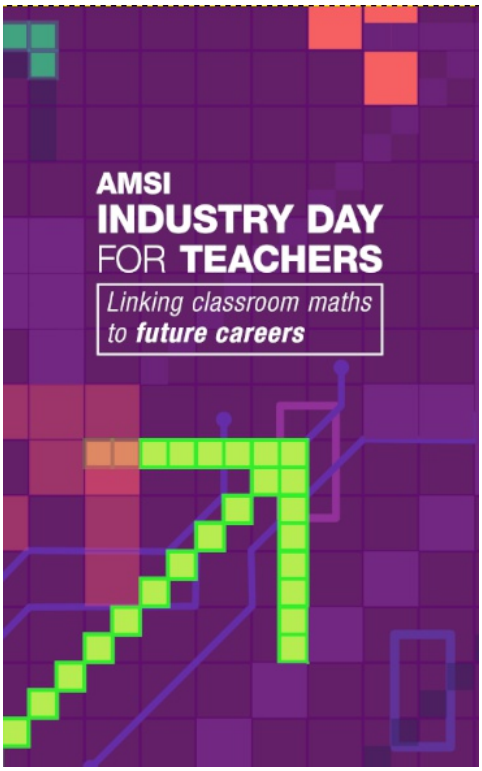
The AMSI Industry Day for Teachers is coming to Sydney ... with an event at the University of Sydney's Camperdown campus on Thursday 23 July.

The free event, [presented] in partnership with the University of New South Wales and the University of Sydney, seeks to bridge the gap between school mathematics and career opportunities.

By bringing secondary mathematics and STEM teachers and careers advisers together with industry professionals and tertiary educators, the program aims to help teachers better understand the breadth and scale of mathematics dependent career pathways available to their students.

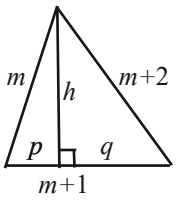
For more information about this and some similar AMSI events go to https://amsi.org.au/amsi-industry-day-for-teachers/.

Click this link to register.



SOLUTION TO PUZZLE IN VOL 17 NO 6

Difference



Explain why, in this diagram, m has to be greater than 1. It is not hard to see that q must be greater than p, but we can also discover *how much* greater q is than p, and thus get a better lower bound for m. The process reveals the least value of m such that m, p, q and h are all integers. Are there other values of m with this property?

The following 'solution' is longer than usual, yet does not exhaust the possibilities for exploration and proof.

The quantity m has to be greater than 1 because, by the triangle inequality, the sides must be such that $m + (m + 1) > (m + 2)$.

Since $(m + 2)^2 - h^2 > m^2 - h^2$, we have, by Pythagoras, that $q^2 > p^2$ and so, $q > p$.

Similarly, using expressions for p^2 and q^2, we can write $q^2 - p^2 = ((m + 2)^2 - h^2) - (m^2 - h^2)$. After simplification, this is $(q + p)(q - p) = 4(m + 1)$. Then, since $q + p = m + 1$, we conclude that $q - p = 4$.

In the simplest case, $p = 0$ and $q = 4$, and m coincides with h. The sides of the triangle are 3, 4, and 5. That is, the greatest lower bound for m is 3.

It turns out that there are a great many values for m that make the quantities p, q, m and h all integers.

The next few are: $m = 13, 51, 193, 723, 2701, 10083, 37633, 140451, \ldots$.

A further challenge would be to show that the sequence of these triangles with integer sides and height is infinite, and that they occur whenever a known value of m is increased by a ratio converging to approximately 3.732... .

Observe that if the list of values for m goes on indefinitely and m becomes very large, there is not much difference between m, m+1 and m+2. The triangle will be approximately equilateral with height approaching m sin 60°.

By equating Heron's formula for the triangle area and the half-base-times-height formula, we can deduce that $h = \frac{1}{2}\sqrt{3(m+3)(m-1)}$.

We need to look for values of m that make this expression an integer. Note that the square root must be an even integer, so m must be odd.

It falls out that $p = \frac{1}{2}(m-3)$ for all m . Thus, if m is an odd integer, p is also an integer, which means that if m and h are integers then so are p and q.

PUZZLES

1 Comparison

Without calculating any square roots, decide which is the larger of $\sqrt{26}$ and $\sqrt{17}+1$.

2 Four swallows

$$\sqrt{1^3} = 1$$
$$\sqrt{1^3+2^3} = 1+2$$
$$\sqrt{1^3+2^3+3^3} = 1+2+3$$
$$\sqrt{1^3+2^3+3^3+4^3} = 1+2+3+4$$

Could it be that some things are not wht they seem?

3 Conundrum

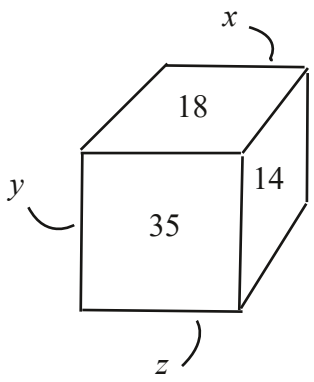
Two test papers are given to a maths class. One paper is marked out of 30 and the other out of 45. One of the students achieves 23/30 and 27/45 on the papers and is given a total mark of 50/75.

Coincidentally, Question 3 on the first paper asks the students to evaluate the sum

$$\frac{23}{30}+\frac{27}{45}$$

The teacher decrees the correct answer to be 41/30, but some students think the answer 50/75 should also be marked correct as it follows from the teacher's own practice. How might this confusion be resolved?

4 Hexahedron with primes



If x, y and z are prime numbers and the sum of pairs of numbers on opposite sides is a constant, what are the values x, y and z?

STREAMING

The Conversation of 8 June 2026 reports on the findings of recent research on streaming in the UK. According to the piece in The Conversation, 'This new study can and has been interpreted as showing streaming benefits some students while creating no harm to others'. The piece goes on to say:

'The findings ... seem to contradict previous claims that streaming can harm some students without benefiting others.' However,

'... the findings do reinforce previous research suggesting streaming is inequitable and widens achievement gaps.'

The Conversation article canvasses some of the issues surrounding ability grouping and ends with a recommendation of caution against adopting streaming as a policy.

We may note that there may be variables in Australian and local classrooms that cannot be accounted for in a UK study, and effective practices in particular schools concerning mixed ability classrooms could well upset the reported statistical result.

This is a report of a report of a report. The original study can be accessed here.

REVIEW

Readers of recent pieces on education in the online journal Inside Story could easily respond with gloom. Teachers may even edge into despair. Yet the author, Dean Ashenden, is saying something that needs to be said.

In the May edition, 'Stuck' is a review of two new books: Jane Caro's *Rich Kid Poor Kid*, and Geoff Masters's *The Children We Leave Behind*. These books contain outrage and critical analysis of the Australian education system with its widening inequities. Their authors scrutenise governments, top-down bureaucratic controls and meddlesome self-interests.

Ashenden urges radical reform of the system, concluding with: 'The best hope lies in a movement from below, a bigger and more sustained version of the "I Give a Gonski" campaign of 2012–13, bent on loosening the ties that bind schooling to its socioeconomic role ...'

In the June edition, 'Crackdown' speaks against the same systemic failures as in the previous piece now with a focus on the currently ascendent conservative authoritarian view of education, which he describes vividly. By contrast he says, '*Curriculum* is a relationship before it is a menu'.

Ashenden cites Michael Young's classic *The Rise of the Meritocracy* (1958) and suggests that '... governments, state and federal are driving a form of schooling that is fuelling the voter base for One Nation'.

LANGUAGE USE IN CLASSROOMS

From Victoria Norford (PhD Candidate, School of Education, University of New England, NSW, Australia):

I am writing about a current research project exploring language use in Australian secondary school classrooms and teachers' views on students' heritage languages.

Heritage languages might also be called home languages or community languages. These are the languages other than English that students may use when they are interacting with their family or community.

Even if you teach in a school with few students from diverse backgrounds, we are interested in hearing from you.

We are hoping to give voice to the views of as many teachers as possible, and Maths teachers in ACT would provide very important perspectives in the Australian context.

To participate in this research, go to the site bit.ly/4f7kimy or click here. The survey should take about ten minutes.

ATO FUN



The Australian Tax Office Tax, Super + You competition for students in years 7–12 is underway!

Make learning about tax and super fun, engaging, and rewarding with more than $12,000 in prizes up for grabs.

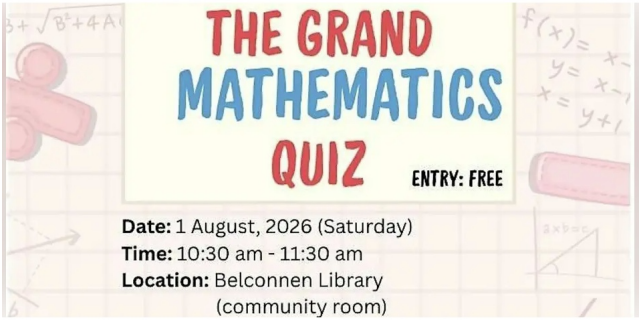
Entries close 5:00pm AEST on 4 September 2026.

Check out the competition teachers' information page on the ATO website for everything you need to know from tips to free classroom resources.

The Tax, Super + You competition is a fun, hands-on way for high school students to discover why tax and super matter in everyday life. Students can enter solo or as a team to create an imaginative project all about tax and super. They can write it, film it, design it, build it or even animate it.

GRAND MATHEMATICS QUIZ

From Hemant Kumar Mulmudi:



Get, set and be ready to put your math skills to the test at 'The Grand Mathematics Quiz'.

This exciting and challenging in-person event is perfect for math lovers of all levels (high school pupils year 9, 10, 11, 12) and undergrads (year 1) and would be of interest to any math enthusiast. If you would like to participate, don't hesitate to proceed with registration.

Join us on a saturday morning full of exciting problems, and challenging questions, friendly competition, and lots of learning. Don't miss out on the chance to show off your number skills and meet fellow math enthusiasts. Come with your thinking cap on and let's have a blast and play with numbers, geometry, probability and statistics.

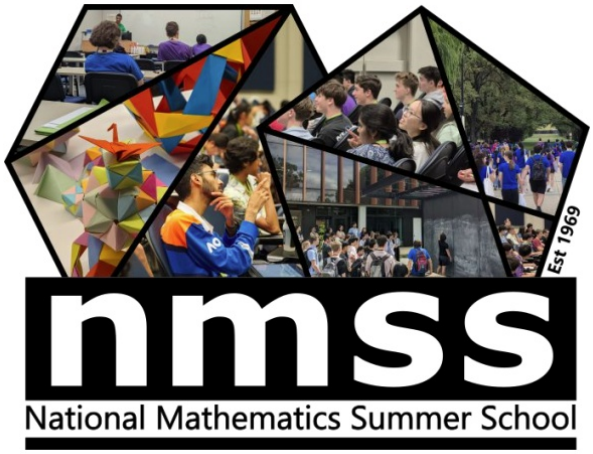
Light refreshments will be provided at the end of the quiz.

For enquiries, please contact Hemant Kumar Mulmudi on hantuumt@gmail.com or 0426 884 320.

Click on the graphic to reserve a spot.

NMSS 2027

Comprehensive information about the Summer School is available on the NMSS website.



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ISSN 2207-5755

ABOUT THE CMA

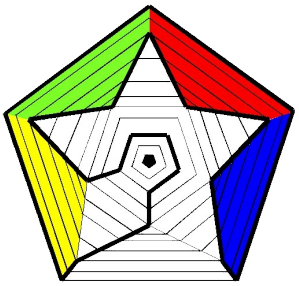
The Canberra Mathematical Association (Inc.) is the representative body of professional educators of mathematics in Canberra, Australia.
It was established by, among others, the late Professor Bernhard Neumann in 1963.
It continues to run - as it began - purely on a volunteer basis.
Its aims include:

- 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.

Short Circuit is the newsletter of the Canberra Mathematical Association Inc.
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The vertices of a dodecahedron belong to a Hamilton circuit.



TOO PRETTY TO DO MATHS: THE T-SHIRT THAT DOESN'T ADD UP

This is not a joke. On the front of a T-shirt on sale at Myer, made by Australian fashion house Lioness, there are six words in casual script: "I'm too pretty to do math" (sic).

Sit with that for a moment.

Yes, it's no joke. It is an identity statement. A girl doesn't see it as ironic. She sees it modelled on someone who looks like the girls she compares herself with – or even aspires to be – sold in a store her parents take her to. She absorbs the message, consciously or not, that this is an identity available to her. Pretty girls don't do maths. Maybe that's who I am.

It tells the girl wearing it, and everyone who reads it, that prettiness and mathematics are mutually exclusive; that who you are is a reason not to think; that if I want to be pretty, I can't do maths—in short, [it is] one of the most corrosive stereotypes in Australian education, printed on cotton and available at one of our most trusted department stores.

This is not a new idea. That is precisely what makes it so inexcusable. Only last year, the Advertising Standards Authority in New Zealand ordered the removal of an ad that promoted a pink backpack targeted at young primary aged girls that said: "Can't do long division". The watchdog determined that it perpetuated a myth that "girls aren't good at maths".

In 2014, Libra sanitary products were sanctioned for reinforcing negative stereotypes in an ad that read: "Absorbs more than you ever did in maths class". In 1992, Mattel launched a Barbie doll that said, "Math class is tough" - and had to remove these Barbies from shelves in the face of public outrage.

The world has changed, almost beyond recognition, since then. The defining challenges of our age: artificial intelligence, automation, climate change, to name only a few, are mathematical challenges. The girls in classrooms today will inherit those challenges. We cannot afford to tell them maths belongs to someone else.

I work alongside the educators who daily try to undo exactly this kind of damage. They work with girls in primary school who are already brilliant mathematical thinkers, building the confidence of young people who think mathematics is not for them.

The research is unambiguous: girls who come to believe they are "not maths people" disengage earlier, opt out of STEM pathways and are underrepresented in some of the economy's most important and well-paid careers. This is not a pipeline problem, it is an economic and cultural problem. And culture includes what we wear.

The freshly launched Towards Excellence in Teaching Mathematics, a national framework, is founded on the principle that every student deserves access to rich, meaningful mathematical learning. Every student.

Then came the T-shirt.

My daughter is in year 6. She loves the things many girls her age love. She is also one of the most tenacious mathematical thinkers I know, the kind of kid who leans into a hard problem rather than away from it. She has never once suggested these two things are in conflict. Instead, a T-shirt at Myer suggested it to her.

That is the cost of this product. The cost is paid over years, in classrooms, in subject selections, in career choices never made. The cost is made in our economy today and our economy tomorrow.

Myer should remove this product. Not because of a social media storm but because a retailer with Myer's reach and reputation has a responsibility to consider what it normalises.

Lioness, the brand behind it, should know better, too. It's in their name, surely? That said, here's an Australian brand targeting Australian girls. But they can't even spell it the way Australians do!

And to every girl who has ever been made to feel that her appearance and her intellect are in competition: they are not. They never were.

The mathematicians, the engineers, the data scientists, the economists reshaping our world are not defined by whether they are pretty. They are defined by the fact that nobody told them they were "too" anything to think.

You are not too pretty to do maths. Nobody is.

Allan Dougan is the chief executive of the Australian Association of Mathematics Teachers.