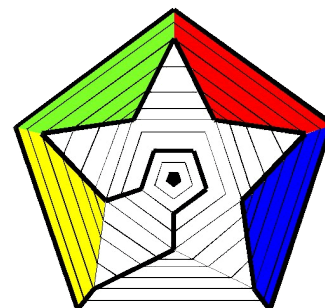


SHORT CIRCUIT

Canberra Mathematical Association Inc.

VOLUME 15 NUMBER 11 NOVEMBER 2024



NEWS AND COMMENT

The Canberra Mathematical Association will hold its **Annual General Meeting** on 12th November at Erindale College. An invitation to the meeting may be found on page 2. Come and enjoy some friendly chat and a good meal.

The University of New South Wales, Canberra, is introducing a new course called Bachelor of Cyber Security, to begin next year. Current years 11 and 12 students may benefit from knowing about it. A two page spread about the course may be seen at the end of this newsletter. (The reproduction may be hard to read due to the number of times it has been transmitted and copied through cyberspace. If so, refer to the UNSW [website](#).)

On page 5 there is a non-mathematical book review. This reflects CMA's ongoing concern with improving outcomes in mathematics education for First Nations students. It seems likely that teachers who are aware of the experiences in the collective memories of their students and

their families will be better equipped to create a climate of learning in their classrooms.

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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- Puzzle—p.5
- Book review—p.5

**CANBERRA
MATHEMATICAL
ASSOCIATION**

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>



EXPLICIT TEACHING

Sue Wilson writes:

I was just reading the latest Mathematics Task Centre e-news - Doug Williams' article on (what is meant by) explicit teaching. I found it very interesting, ...

The Mathematics Centre e-news article to which Sue refers may be accessed at this [address](#). The following is a truncated version of the article that is intended to give the flavour of Doug's remarks. Click on this [link](#) to get the full text, and more.

Explicit Teaching: Opportunity or Opportunity Lost?

Explicit teaching seems to have become a trendy expression recently. Without further investigation those words suggest encouraging teaching that is *clear and easy to understand*. However, if that's the case, why are they popping up more often? *Clear and easy to understand* is every teacher's aim/hope for every lesson.

Perhaps that aim is exactly the reason why the words are popping up. *Clear and easy to understand* is every teacher's aim, and to achieve it every teacher makes teaching craft choices when planning and executing a lesson. Perhaps Explicit Teaching is a new catch phrase for encouraging teachers to make those choices based on a broader range of pedagogies.

If a focus on Explicit Teaching *is* an opportunity intended to support teachers to become increasingly conscious of, and confident in, choosing pedagogies as part of planning, executing and reviewing each lesson, that would be a significant positive for mathematics teaching and learning.

But so far these thoughts are supposition. Time for further investigation.

These words from the NSW Department of Education were listed first for my web search on 'explicit teaching':

Explicit teaching practices involve teachers clearly showing students what to do and how to do it, rather than having students discover

that information themselves.

which concerned me a little - not for what it includes, but for what it excludes.

Showing students what to do and how to do it *is* a legitimate strategy - sometimes - but to place it in opposition to students discovering information for themselves - a pedagogy that is at least equally valuable - could hardly be described as inclusive education. The statement implies excluding from learning those students who prefer to sometimes learn for themselves.

... perhaps the NSW department didn't intend that since, ... it is found deep in the primary reading section of the Literacy and Numeracy part of the site.

Could it be that Explicit Teaching is a teaching craft tool designed for learning to read, rather [than] learning to work like a mathematician?

... references from the NSW system and its Victorian equivalent and the Australian Education Research Organisation and more, all suggest that Explicit Teaching is a highly structured teaching strategy and use phrases such as 'powerful, evidence-based teaching', 'show students what to do and how to do it', 'breaks down what students need to learn into smaller learning outcomes and models each step'.

All this may be so, but why must there be a revolution-style incursion into the way teachers are currently making excellent and appropriate teaching craft choices using an equally well researched, evidenced-based range of learning features?

No one believes that just one teaching strategy in mathematics education ... is going to encourage the best mathematics learning for all students at all times. So why try to introduce improvement with an approach that creates that impression?

YEAR 12 MATHS MEDALS

The CMA is once again offering to any school or college which wants one a medal to be awarded to the top Maths student in Year 12.

Medals can be collected from Peter McIntyre in Kambah (0403 509 952) or Valerie Barker in Aranda (0410 151 554).

The school is responsible for any engraving.

THE MATTHEW EFFECT

Gerard Barrett sent in a comment after reading the article *DIFFERENCE* in last month's edition.

Gerard notes:

The biblical quote in October Short Circuit:

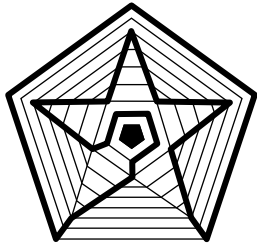
...to those that have, more will be given, and from those who have not, even what little they have will be taken away from them.

is from the gospel of St Matthew 25:29.

Its education meaning is widely quoted by Hattie and others as the "Matthew Effect". That is those who pick up early in subjects like English, mathematics and science will continue to be advantaged in learning while those who are not early successes will be left further behind as their exposure to education continues.

The Matthew Effect emphasises for us all the importance of chasing success for every student beginning at day 1.

The Hattie reference I have seen most recently is in *Visible Learning: The Sequel* p 252. Hattie was not the originator of the term but he is more widely published than most educators so it is more likely to become known through his work.



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.

**NEWSLETTER OF THE CANBERRA
MATHEMATICAL ASSOCIATION INC. INC**

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Australia

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

THE 2024 CMA COMMITTEE

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	Jo McKenzie
	Jenny Missen
	Morgan Murray
	Bernadette Matthew

Radford College
Erindale College
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University of NSW Canberra
Australian Catholic University

Melba Copland Secondary School
ACT Education Directorate
Lake Ginninderra College
St Thomas the Apostle Primary
Mother Teresa School



Theresa Shellshear is CMA's COACTEA representative.

Bruce Ferrington is CMA's AAMT representative.



Find us on Facebook

Short Circuit is edited by Paul Turner.

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PUZZLE

Hard polynomial

This one comes from a 2003 Australian Maths Trust booklet.

Given that, in the following equation, the coefficients p and q are integers, explain why

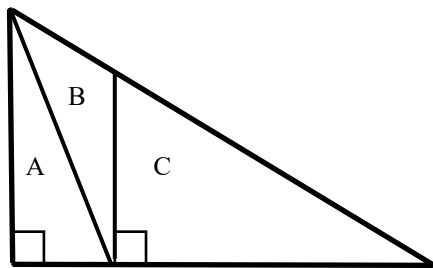
$$px^7 - qx^6 - 4px^5 + qx^2 - 8 = 0$$

has no integer roots.

PUZZLE SOLUTION from [Vol 15 No 10](#)

Three areas

We are asked to evaluate $A/B - B/C$ where A , B and C are the areas of the smaller triangles.



Recall that areas of triangles with a common 'base' are in proportion to their respective 'heights'.

Adopting the notations A_x and A_y for the horizontal and vertical dimensions of the triangle with area A , and similarly for the other triangles, we can write $A/B = A_y/C_y$ and $B/C = B_x/C_x$. Hence, $A/B - B/C = A_y/C_y - B_x/C_x$.

The large enclosing triangle is similar to the triangle with area C . Let its horizontal and vertical dimensions be X and Y respectively. Then

$$A_y = Y \text{ and}$$

$$B_x = X - C_x,$$

so that the expression becomes

$$Y/C_y - (X - C_x)/C_x.$$

This is $Y/C_y - X/C_x + 1$.

The first two terms are equal because of the similar triangles. Thus,

$$A/B - B/C = 1.$$

STRENGTH IN NUMBERS

Season three of AAMT's Strength in Numbers podcast series is out. Hear the latest edition and catch up on earlier ones at

<https://aamt.edu.au/teachers/event/strength-in-numbers/>.

or on your preferred platform.

BOOK REVIEW

The book, *Daughter of the River Country*, is the story of Yorta Yorta woman Dianne O'Brien, written by Dianne O'Brien with Sue Williams.

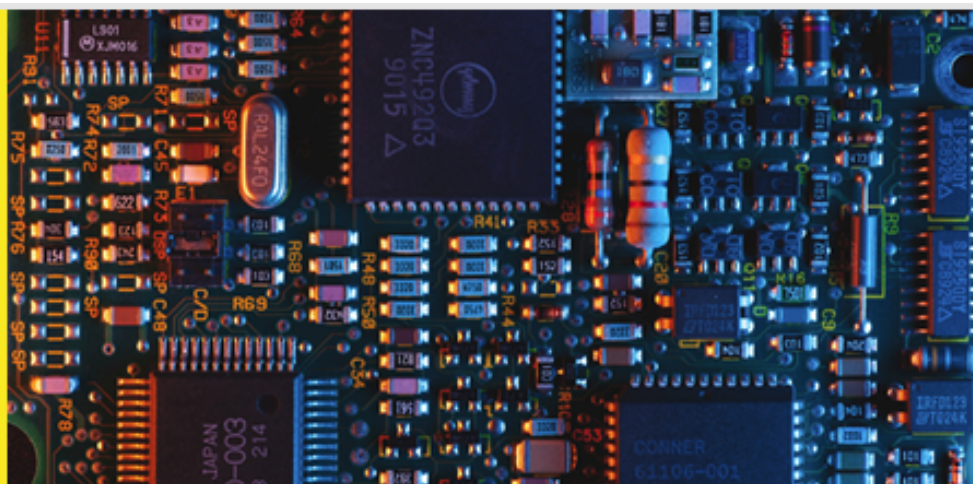
It is an often harrowing tale that illuminates what must have been the experience of a great many First Nations children of the stolen generations and the adults they became. To quote from the foreword,

'Growing up, it seemed like we had a good life. I had a wonderful mother who loved me, a dad who took me fishing, an older half-brother who looked out for me, and lots of mates. ... Later on, I discovered nearly everything had been a lie, and my world crumbled.'

Reading this account should dispel any doubts one might have about the lingering inter-generational consequences of the policies that led to the separation of children from their parents.

The author relates her life story in a matter-of-fact way through happiness to disillusionment, through gross mistreatments and injustices, through tragedies, through barely survivable hardships, and eventually to her emergence as a community leader in various roles. It is a story of living through truly evil circumstances, but also one of remarkable resilience, a story of hope.

The book was published in 2021 by Echo Publishing.



Bachelor of Cyber Security

Key features

80.00 ATAR indicative

Based in Canberra

Domestic students only

Trimester delivery

Industry Linked – Work
Integrated Learning

Scholarship opportunities

Gain the critical skills that will give you a technical edge in both a government and broader industry career

UNSW Canberra's Bachelor of Cyber Security is a future-focused, three-year degree informed by critical government and industry skills gaps. Graduate ready to make an impact in a constantly evolving cyber security landscape, with the skills and competencies that will make you in demand across industry, government and Defence.

You'll study a range of targeted courses developed to respond to the needs of government and industry within a sector defined by rapid change.

Gain the key skillsets required for cyber security professionals, including:

- > Penetration testing
- > Fundamentals of programming
- > Web security
- > Cloud security
- > Cryptography
- > Offensive and defensive cyber techniques

More info:





unsw.edu.au/canberra



unsw.edu.au/study/help/contact-us

Disciplinary Core + Electives:

 16 Core Courses	 4 Minor Courses
 2 Free Electives	 2 General Electives

First Year

T1

ZSPS1111
Introduction
To Information
Technology

T2

General Elective

T3

ZSPS1113
Computer
Architectures and
Operating Systems

ZSPS1337
Introduction To
Cyber Security

Minor Course 1

ZSPS1110
Cyber Crimes
& Ethics

ZSPS1112
Programming
Fundamentals

ZSPS2115
Computational
Mathematics and
Cryptography

Second Year

T1

ZSPS2110
Data Structures
& Algorithms

T2

Minor Course 2

T3

ZSPS2113
Ethical Hacking &
Penetration Testing

ZSPS2112
Web Application
Security

Minor Course 3

ZSPS2114
Cyber Defence

Free Elective

ZSPS2111
Knowledge
Representation
& Databases

Third Year

T1

ZSPS3110
Human-Centric
Cyber Security

T2

Minor Course 4

T3

ZSPS3114
Critical
Infrastructure
Protection

ZSPS3111
Digital Forensics &
Incident Response

General Elective

ZSPS3113
Cloud Computing &
Security

ZSPS3112
Internet of Things &
Network Security

Free Elective

Minor: Intelligent Cyber Security

Students must complete 24UOC
of the following courses:

- Machine Learning for Cyber Security (6UOC)
- Deep learning for Cyber Security (6UOC)
- Trustworthy AI for Cyber Security (6UOC)
- Cyber Security Industry Compressed Project (6UOC)

Minor: Cyber Security Industry Application

Students must complete 24UOC
of the following courses:

- Enterprise Cyber Security Governance and Policy (6 UOC)
- Cyber Security Entrepreneurship (6 UOC)
- Cyber Security Industry Project (12 UOC)
- Cyber Security Industry Compressed Project (6 UOC)

