YBMA News

Vol.35 No.3   May 2026

The Newsletter of the Yorkshire Branch of the Association for Mathematics in Education

If, like myself, you bookmarked and regularly visited the AMiE website, you would have noted how little has changed in recent months. The old MA and ATM sites are still there, yet have had no updates since the merger. We hope that the promised, fully-featured AMiE website will be ready for the 2026-27 academic year.

A big national one-day get-together was held in London in early April. For those who were unable to go and would like to see what was on offer, a set of four *AMiE Member Day* videos is now available online. Perhaps a full conference, with a wide choice of member-led sessions, will return next year.

Readers will have noticed that (so far) we have resisted changing the title of this newsletter. Inevitably most acronyms are overworked and YBMA is also the code used by ICAO, a UN agency, for an airport in Australia. YBAMiE is too long, but perhaps YBA would do? Oh no, that's already in use for *Your Bizarre Adventure*, a Roblox game!

We are not yet able to announce full details of our Yorkshire Branch events for 2026-27, but will do so in our September Newsletter.

2026-27 Programme

October 2026	**Autumn Meeting**
December 2026	**Christmas Quiz**
February 2027	**Spring Meeting**
March 2027	**W. P. Milne Lecture**
June 2027	**Summer Meeting**

All to be held at The University of Leeds

Summer Meeting

Saturday, 6 June 2026
2pm for 2.30pm

MALL 1, School of Mathematics
University of Leeds

Chris Pritchard

MA President 2021-2022

A Tribute To Martin Gardner

Martin Gardner ran the Mathematical Games column of Scientific American for 25 years. He collated an extensive range of fascinating material sent in by mathematicians from around the world, and later gathered many of the themes into a stream of best-selling books. I will tell the story of his life and share some of the games, problems and puzzles which are suitable for mathematicians of all ages and abilities.

followed by

Yorkshire Branch Annual General Meeting

Reports

Election of Officers & Committee

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Refreshments will be provided

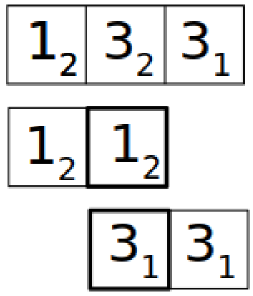
YBMA Officers 2025-26

President: Lindsey Sharp (lindseyelizab50@hotmail.com)

Secretary & Newsletter: Bill Bardelang (rgb43@gmx.com)

Treasurer: Jane Turnbull (da.turnbull@ntlworld.com)

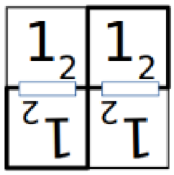
Tetraflexagons



Take a strip of paper consisting of three squares side by side. Label the squares on the front from 1 to 3 as indicated on the right. The subscripts show the labels to go on the back.

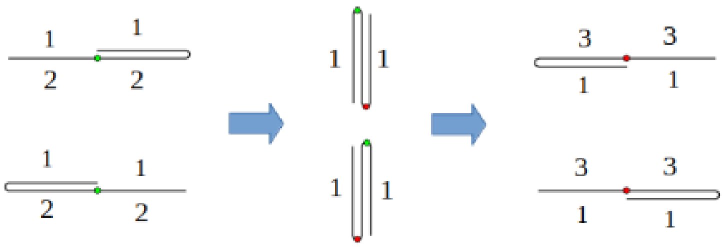
If we fold the right-most square on top of the middle square, then the front shows all 1s, the back all 2s and the 3s are hidden. (State A)

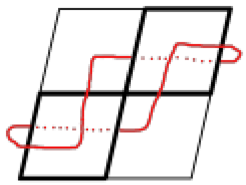
If we fold the left-most square under the middle square, then the front shows all 3s, the back all 1s and the 2s are hidden. (State B)



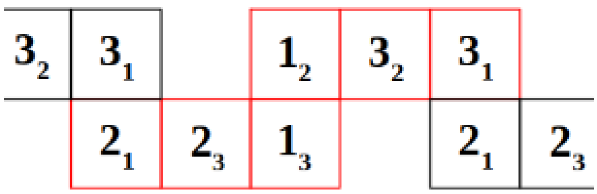
Take two strips in state A, reverse the direction of the second and place it touching the first. Join the top squares with two sticky labels as shown. You have now made a tri-tetraflexagon, the simplest of the tetraflexagon family. Currently it shows all 1s on the front and all 2s on the back, but "flexing" it will reveal the hidden 3s, i.e. switch both halves into state B.

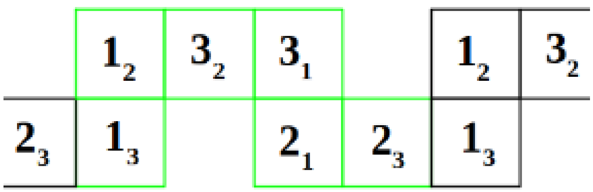
The diagram below shows how. Fold the flexagon along its centre line until the squares on the back of each strip touch. Open the flexagon up again from the top to reveal a full set of 3s.





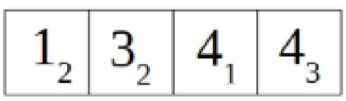
We used two 3 × 1 strips of paper, folded over in the same way, to make our tri-tetraflexagon. Once the two strips are linked, the six squares form a closed loop. Traversing the loop can be thought of as going along an infinite strip repeating itself every six squares. To make the flexagon from a single piece just take any six connected squares, fold and then join up the ends. Here are two possibilities.

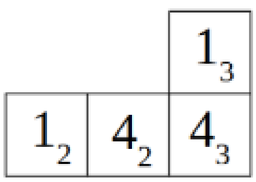


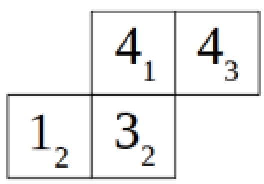


The six red squares divide quite naturally into the two straight strips of three we used in our construction. The six green squares divide into two V-shaped sets of three and we could instead have used these and achieved the same end result. The 3-faced tri-tetraflexagon is essentially unique and exists in two states, in our case [1, 2] and [3, 1] according to which faces are visible.

We challenge the reader to investigate the 4-faced tetra-tetraflexagon. Several distinct forms exist, some with three and others with four configurations. They can be created from pairs of strips joined together in the same way as the tri-tetraflexagon. The list below does not claim to cover all cases. We suggest folding together first the 4s and then the 3s.







Happy Flexing!

Easier Factorising – Some Comments

The example used in the February Newsletter could be done as follows. Using a substitution we can set the coefficient of the quadratic term to 1 and find it now multiplies the constant term:

$$6x^2 - x - 12 \quad = \quad \frac{1}{6}(36x^2 - 6x - 72) \quad = \quad \frac{1}{6}(y^2 - y - 72)$$

Then we factorise the "easy" quadratic expression, substitute back and tidy up.

$$= \quad \frac{1}{6}(y+8)(y-9) \quad = \quad \left(\frac{6x+8}{2}\right)\times\left(\frac{6x-9}{3}\right) \quad = \quad (3x+4)(2x-3)$$

More rigorous, but more cumbersome. A direct verification of the approach would be to expand

$$(ax+b)(cx+d) \quad = \quad acx^2 + (ad+bc)x + bd$$

and then reverse by applying the instructions one step at a time:

$$x^2 + (ad+bc)x + acbd \;,\; (x+bc)(x+ad)\,,\; \left(x+\frac{bc}{ac}\right)\left(x+\frac{ad}{ac}\right),\; \left(x+\frac{b}{a}\right)\left(x+\frac{d}{c}\right),\; (ax+b)(cx+d)\,.$$