

# The Scottish Mathematical Council

www.scot-maths.co.uk

## MATHEMATICAL CHALLENGE 2025–2026

### Golden Jubilee Year

Entries must be the unaided efforts of individual pupils.

Solutions must include explanations and answers without explanation will be given no credit.

Do not feel that you must hand in answers to all the questions.

CURRENT AND RECENT SPONSORS OF MATHEMATICAL CHALLENGE ARE

*The Edinburgh Mathematical Society, The Maxwell Foundation,*

*The London Mathematical Society and The Scottish International Education Trust.*

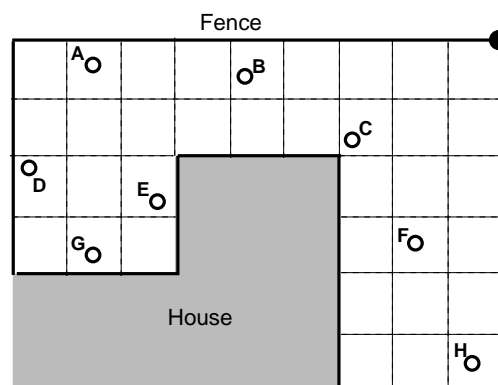
The Scottish Mathematical Council is indebted to the above for their generous support and gratefully acknowledges financial and other assistance from schools, universities and education authorities.

Particular thanks are due to the Universities of Aberdeen, Edinburgh Napier, Moray House, St Andrews, Stirling, Strathclyde and to George Heriot's School and Gryffe High School.

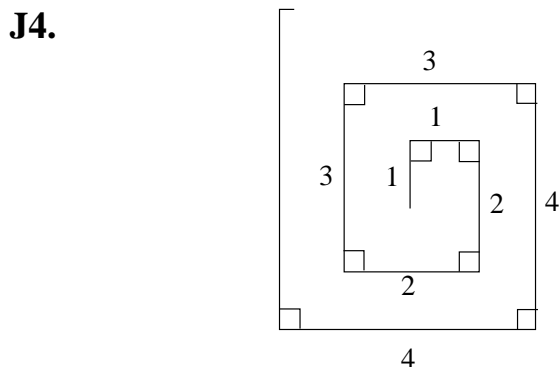
### Junior Division: Problems 1

- J1.** Cathy has moved to a house in the countryside and is enjoying watching the birds, foxes and even a badger visit the garden. She decides to fix her  $360^\circ$  camera to the corner of the fence to record the comings and goings.

- Which of the creatures (A to H) will the camera be able to see?
- Cathy reckons there's 12% of the garden that is hidden from the camera. Explain if she is correct.
- What is the best place to put the camera to see more of the garden?



- J2.** Find the 2-digit primes which have the following properties
- the number obtained by reversing the digits is also prime,
  - the difference between these two primes is a non-zero perfect square.
- J3.** Each of the 12 edges of a regular octahedron is coloured either blue or red. Every face of the octahedron has at least one blue edge. What is the smallest possible number of blue edges? Explain how you can be sure it is the smallest possible number of blue edges.



A “rectangular spiral” consists of line segments of lengths, in cm, 1, 1, 2, 2, 3, 3, 4, 4, ... where each line segment is at right angles to the previous one drawn as shown. On a large sheet of paper Abby draws the rectangular spiral starting from the centre. Her pen runs out of ink after 4000 cm.

What is the length of the longest line segment she draws?

SEE OVER FOR QUESTION J5

AND FOR LINKS TO THE MATHS CHALLENGES ARCHIVES



# Mathematical Challenge Problems 1

JUNIOR DIVISION 2025-2026

PLEASE USE CAPITALS TO COMPLETE

SURNAME

OTHER NAME(S)  
(underline the one  
you prefer)

SCHOOL

AGE

YEAR OF STUDY

FOR OFFICIAL USE

Marker

Marks

1	2	3	4	5

Total

— — — — - CUT ALONG HERE — — — —

Please write your solutions on A4 paper and staple the above form to them.

PLEASE WRITE YOUR NAME ON EVERY PAGE.

Send your entry through your school to the section organiser.

For further information on the competition, please see the School Materials which have been distributed to schools. A copy of these Materials can be obtained from

<http://www.wpr3.co.uk/MC/materials/index.html>

There are separate links for primary and secondary schools. This page also includes a list of authorities in each section and names and addresses of section organisers.

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## Junior Division: Problems 1 continued

**J5.** There are 8 points on a piece of paper. Exactly 5 of the points are on a straight line. No other straight line passes through more than two of the points. Three points are selected to form the vertices of a triangle.

How many different triangles with non-zero area can be formed in this way?

**END OF PROBLEM SET 1**

CLOSING DATE FOR RECEIPT OF SOLUTIONS :

31 October 2025

**Look out for Problems 2 in late November!**

**For information about Mathematical Challenge, look on the MC web site:**

[www.scot-maths.co.uk](http://www.scot-maths.co.uk)

## MATHS CHALLENGES ARCHIVES

There are archives of previous questions on: [www.wpr3.co.uk/MC-archive/J/index-J.html](http://www.wpr3.co.uk/MC-archive/J/index-J.html)

Here is a shortcut for your  
smartphone or tablet

