



# The Scottish Mathematical Council

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

## MATHEMATICAL CHALLENGE 2024–2025

**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, Gryffe High School and Kelvinside Academy.

### Primary Division: Problems II

- P2.1** Seven identical cakes are to be shared between eight guests at a party. In order to prevent arguments, each guest must be given an equal amount of cake.  
What is the smallest number of separate pieces that the cakes can be cut into to achieve this?  
How can these cuts be made so that each guest gets their share in at most two pieces?



- P2.2** I like Felicity better than Joanne. They are both hockey players – both good hockey players – but Joanne is inclined to brag more than a little.  
‘I’ve scored half as many again as Felicity,’ she told me shortly after last season started. A fortnight later she had scored 7 more, while Felicity had increased her total by only two.  
‘I’ve got twice as many as Felicity now,’ she said. ‘I need only four more before the end of the month to set up a new club record.’  
I couldn’t help being rather pleased when I heard a little later that she hadn’t managed it, and so the old club record for the number of goals scored before the end of May still stands.  
What is the club record?
- P2.3** Three identical balls numbered 1, 2 and 3 are placed in a bag. Without looking, a ball is drawn from the bag and the number noted. The ball is then replaced in the bag. After this has been repeated three times, find the probability that the total of the three numbers is greater than 4.

### END OF PROBLEM SET II

CLOSING DATE FOR RECEIPT OF SOLUTIONS :

**22 November 2024**

**Look out for Problems III in January!**

**Look on the SMC web site: [www.scot-maths.co.uk](http://www.scot-maths.co.uk) for information about Mathematical Challenge.**

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

Here is a shortcut for your smartphone or tablet





# Mathematical Challenge Problems II

PRIMARY DIVISION

2024-2025

**PLEASE USE CAPITALS TO COMPLETE**

SURNAME

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

SCHOOL

AGE

YEAR OF STUDY

P

**FOR OFFICIAL USE**

Marker

Marks

1	2	3	Total
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

— — — — - **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 organiser of the section.

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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