



The Scottish Mathematical Council

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MATHEMATICAL CHALLENGE 2020–2021

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, Professor L E Fraenkel,
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, Glasgow, Heriot Watt, St Andrews, Stirling, Strathclyde and to George Heriot's School, Gryffe High School and Kelvinside Academy.

Primary Division: Problems I

P1.1. The houses on Dunbar Avenue now have three different bins. The recycling bin is green, the bin for garden rubbish is brown and general waste bin is black.

The council have decided that some bins need to be collected more often than others and so have set up a new system rather than using days of the week.

The recycling waste is collected every three days.

The garden waste is collected every six days.

The general waste is collected every fourteen days

The residents were not happy as they insisted that this would mean having to put out all three bins on the same day at least once a month.

On 4th January, all three bins were collected. Was the residents' claim correct?

Explain your answer.

P1.2. The owner of some stables has to fill in yet another form and so he writes:

“My herd consists of horses and foals.

A fifth of the herd is in the yard and a third of the herd is out to pasture. These are all horses.

Three times the difference are the foals, which are in the barn. The remaining two horses, in the paddock, belong to my daughter.”

How many animals are in the herd altogether?

P1.3. The floor of a rectangular room is covered with square tiles. The room is 10 tiles long and 7 tiles wide. In addition, there is a bay window in the middle of a long wall of the room which is 2 tiles deep and 6 tiles across. How many of the tiles have at least one edge which touches a wall of the room?

END OF PROBLEM SET I