

# The Scottish Mathematical Council

www.scot-maths.co.uk

## MATHEMATICAL CHALLENGE 2019–2020

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.*

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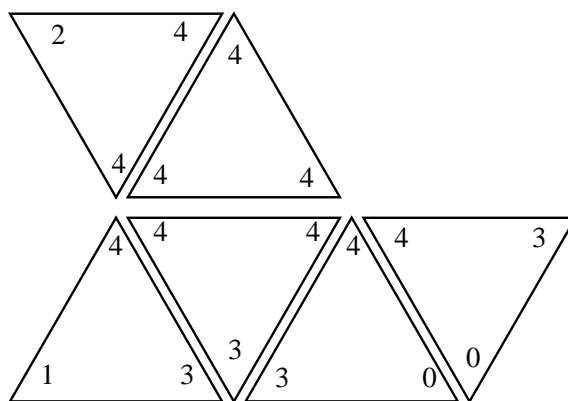
### Primary Division: Problems III

**P3.1.** One of the children bought their teacher a mathematical plant for the classroom windowsill. At the end of the first day it had increased its height by a factor of a half. At the end of the second day it had increased its height from the end of day 1 by a factor of a third. The class found that this pattern continued day after day. How many days did it take to grow to 10 times its original height?

**P3.2.** Three buckets are coloured red, green and blue. Each bucket contains four balls numbered 1, 2, 3, and 4, of the same colour as the bucket. Without looking, Emily chooses one ball at random from each of the buckets. If  $r$ ,  $g$  and  $b$  are the numbers on the balls chosen from the red, green and blue buckets respectively, Emily wins a prize when  $r = g + b$ . What is the probability that Emily wins a prize?

**P3.3.** Three-sided dominoes are equilateral triangles and one face of each domino has a number in each corner and the other side is blank. The numbers range from 0 up to the highest number in the set, 4. Here is an example of a game which started with the 4 4 4 domino.

The set contains all possible different dominoes. How many dominoes are there in the set?



**END OF PROBLEM SET III**