

# The Scottish Mathematical Council

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## MATHEMATICAL CHALLENGE 2012–2013

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.** To encourage Lazy Leonard to work at a job for 36 days, it was decided that he would be paid £4 per day for each day he worked, but he would forfeit £5 for every day he idled. At the end of the 36 days his pay was £0.

How many days did he work and how many days did he idle?

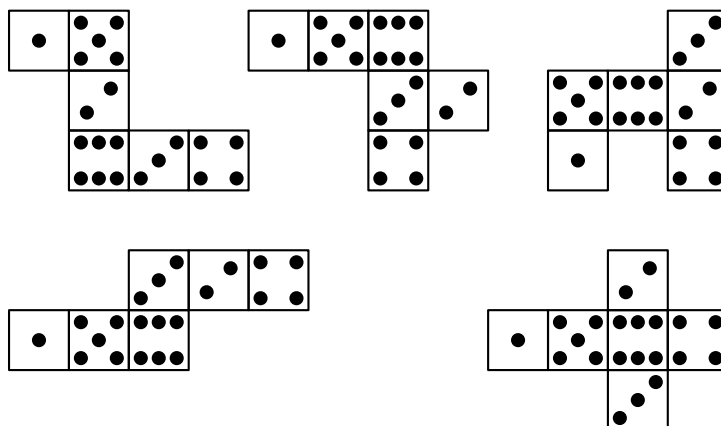
**P3.2.** Andrew has forgotten the code to allow him to unlock his bicycle.

He knows:

- it is a 3-digit number;
- the sum of the digits is 13;
- the outer digits are even;
- subject to these conditions, the product of the digits is as large as possible.

What is the code? Explain clearly.

**P3.3.** A cube can be opened out into a net made up of six squares. But which nets below made up of six squares fold up into a cube? For those that do not, use the spots to explain why not. For those that do, with the given spots, which form a standard dice? Explain.



END OF PROBLEM SET III