



The Scottish Mathematical Council

www.scot-maths.co.uk

MATHEMATICAL CHALLENGE 2011–2012

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, 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, Stirling, Strathclyde, and to Preston Lodge High School, Bearsden Academy, Beaconsfield School and Northfield Academy.

Primary Division: Problems II

- P2.1.** The teacher has set a problem about what weights you can measure with five weights: 1, 2, 3, 4 and 5 g but you decide this is too easy!
If you have five weights, what would be the maximum weight you can weigh any weight up to and including it: what would the five weights have to be ?
- P2.2.** At noon, the hour and minute hands of a clock point in the same direction. Determine, to the nearest second, the last time before noon that the hour and minute hands point in the same direction.

Also determine, to the nearest second, the last time before noon that the hour and minute hands point in exactly opposite directions.
Explain your reasoning.
- P2.3.** A giant timeline is constructed, showing every year from 1AD until 2012. The company which has to make this needs to calculate how many of each digit 0 – 9 will be required. Assuming that no leading zeroes are necessary, how many of each digit will be needed?
Explain your reasoning.

END OF PROBLEM SET II