



The Scottish Mathematical Council

MATHEMATICAL CHALLENGE 2007–2008

Entries must be the unaided efforts of individual pupils. Solutions must include explanations.

Answers without explanation will be given no credit.

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, Dundee, Edinburgh, Paisley, St Andrews, Strathclyde, and to Preston Lodge High School, Bearsden Academy, and Turriff Academy.

Primary Division: Problems I

P1.1. Jack and Kylie are playing a game of table tennis. If Jack loses this game, he will have won the same number of games as Kylie. If Jack wins the game, he will have won twice as many games as Kylie.

How many games had each won before they started this game?

Explain your reasoning.

P1.2. Three friends visit a museum and walk up a flight of stairs.

Ross goes up one step at a time starting with his left foot on the first step. Sheila goes up two steps at a time starting with her left foot on the second step and Tom starts with his left foot on the third step and goes up three steps at a time.

Investigate these questions and explain your answers.

(a) Which is the first step that all three will tread on?

(b) Which is the first step that all three will tread on with their right foot?

(c) Which is the first step that all three will tread on with their left foot?

P1.3. A group of boys found a chestnut tree with the chestnuts just ready for picking. One of the boys climbed the tree and was able to knock down some chestnuts. He had just enough to give himself and the other boys three chestnuts each, with none left over. Then three of their friends joined them. They found that it was not possible to share the chestnuts evenly among the group.

However, when one more chestnut was picked, it was possible to give each boy two chestnuts, with none left over. How many boys were there altogether? **Explain your reasoning.**

END OF PROBLEM SET I