



The Scottish Mathematical Council

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MATHEMATICAL CHALLENGE 2018–2019

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 II

P2.1. The village pantomime this year involved Humpty Dumpty and the King's men. At that disastrous point of the fall, all the King's men ran on stage to put Humpty back together again. Being soldiers, not one of them was without either a sword or a rifle.

One third of those with rifles had swords as well.

One fifth of those with swords had also rifles.

Those with both swords and rifles were the officers and wore red uniforms.

The rest of the men wore white.

Twelve of those in white had rifles.

How many of the King's men did not have a rifle?

P2.2. Mr. Thompson has 4 identical pairs of black gloves and 3 identical pairs of brown gloves jumbled up in a drawer: he did not pair them up when he put them away. The gloves are not interchangeable between hands: each glove will fit only his right hand or only his left hand.

One evening, after dark, the light bulb fails! What is the minimum number of gloves Mr. Thompson will have to pick to be certain to pick a pair of gloves of the same colour?

What difference would it make if he only wanted a pair of brown gloves?

P2.3. Four girls arrived in the school together and have been in the top four positions of the chess tournament in each year since they came. No girl has ever been in the same position more than once.

In second year Dawn was third.

In fourth year Cassie was third.

Anne was second in third year.

In first year Brenda was fourth.

Only once has Cassie beat Dawn.

Who was second in their fourth year?

END OF PROBLEM SET II