STEP III 2013 Question 3 — Examiner Report

A seventh of the candidates attempted this, making this the second least popular Pure question, though with on average, half marks being scored, it was the third most successful of the Pure questions. Some candidates found the scalar product of $p_1 + p_2 + p_3 + p_4$ with itself to obtain the stem correctly, whilst some found its product with p_1 or p_i , in which case they did not always appreciate the importance of symmetry. Part (i) caused few problems. Part (ii) saw a few errors with consideration of $\pm$ signs, though some candidates used geometric considerations and then rotations correctly to obtain the results. The last part separated the sheep from the goats.