

## STEP II, 2009, Q8 EC

**Q8** The vectors question was the least popular pure maths question by a considerable way, and only marginally more popular than most of the applied questions. In general, attempts were short-lived and candidates usually gave up when the algebra got a bit “iffy”. Strangely, an awful lot of attempts began very poorly indeed; the ranges of values of  $\lambda$  and  $\mu$  had a geometric significance relating to where  $P$  and  $Q$  lay on the lines  $AB$  and  $AC$ , and these were not well grasped. Moreover, it was surprising to see diagrams in which the lines had not even been drawn, often leaving the marker to guess whether the points were supposed to be on them or not. Many responses to the next part were so bizarre that they were almost funny: a lot of candidates thought that  $CQ$  etc. were vectors rather than lengths, and the “ $\times$ ” was treated variously as a scalar multiplication, the scalar product and the vector product. Oddly enough, they could all lead to the required answer,  $\lambda\mu = 1$ , even legitimately (with a bit of care) though we were harsh on statements that were actually nonsense. Very few made it to the later stages of the question.



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