



## STEP II, 2011, Q5 EC

**Q5** This vectors question was neither popular nor successful overall. For the most part this seemed to be due to the fact that candidates, although they are happy to work with scalar parameters – as involved in the vector equation of a line, for instance – they are far less happy to interpret them geometrically. Many other students clearly dislike non-numerical vector questions. Having said that, attempts generally fell into one of the two extreme camps of ‘very good’ or ‘very poor’. More confident candidates managed the first result and realised that a “similarity” approach killed off the second part also, although efforts to tidy up answers were frequently littered with needless errors that came back to penalise the candidates when they attempted to use them later on. Many candidates noted that  $D$  was between  $A$  and  $B$ , but failed to realise it was actually the midpoint of  $AB$ . In the very final part, it was often the case that candidates overlooked the negative sign of  $\cos\theta$ , even when the remainder of their working was broadly correct.



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