



STEP II, 2011, Q4 EC

Q4 This question was the first of the really popular ones to attract relatively low scores overall. In the opening part, it had been expected that candidates would employ that most basic of trig. identities, $\sin A = \cos(90^\circ - A)$, in order to find the required values of θ , but the vast majority went straight into double-angles and quadratics in terms of $\sin\theta$ instead, which had been expected to follow the initial work; this meant that many candidates were unable to explain convincingly why the given value of $\sin 18^\circ$ was as claimed.

Despite the relatively straightforward trig. methods that were required in this question, with part (ii) broadly approachable in the same way as the second part of (i), the lack of a clear-minded strategy proved to be a big problem for most attempters, and the connection between parts (ii) and (iii) was seldom spotted – namely, to divide through by 4 and realise that $\sin 5\alpha$ must be $\pm \frac{1}{2}$. Many spotted the solution $\alpha = 6^\circ$, but few got further than this because they were stuck exclusively on $\sin 30^\circ = +\frac{1}{2}$.



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