



STEP II, 2007, Q3 EC

- 3 This was the most popular question on the paper, and many different methods were seen. The intended method was to use the identities $\cos^4 \theta - \sin^4 \theta \equiv \cos 2 \theta$ and $\cos^4 \theta + \sin^4 \theta \equiv 1 - \frac{1}{2} \sin^2 2 \theta$ to evaluate the integrals of $\cos^4 \theta - \sin^4 \theta$ and $\cos^4 \theta + \sin^4 \theta$, and hence be able to write down

separately the values of the integrals of $\cos^4 \theta$ and $\sin^4 \theta$. A similar approach works well for $\cos^6 \theta - \sin^6 \theta$ and $\cos^6 \theta + \sin^6 \theta$. Other methods were, of course, acceptable, and many candidates received high marks for this question.



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