

## STEP II, 2014, Q4 EC

### Question 4

Many candidates were able to perform the given substitution correctly and then correctly explain how this demonstrates that the integral is equal to 1. The second part caused more difficulty, particularly with candidates not able to state the relationship between  $\arctan x$  and  $\arctan\left(\frac{1}{x}\right)$ .

Attempts to integrate with the substitution  $v = \arctan\left(\frac{1}{u}\right)$  often resulted in an incorrect application of the chain rule when finding  $\frac{dv}{du}$ .

In the final part of the question many candidates attempted to use integration by parts to reach the given answer.



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