

## STEP III, 2014 , Q4 EC

4. Two thirds of the candidature attempted this but with only moderate success earning just a third of the marks. The very first result was frequently obtained although some fell at the first hurdle through not appreciating that they needed to use  $\sec^2 x = 1 + \tan^2 x$  , or else that there was then an exact differential. The second result in part (i) was 'only if' whereas many read it, or answered it, as 'if'. In part (ii), most spotted  $b = a$  . There were many inappropriate functions suggested for the last part of the question, many which ignored the requirement that  $y = 0 , x = 1$ .



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