

## STEP III, 2017, Q5 EC

### Question 5

Very slightly more popular than question 4, the marks scored were on average 1 less per attempt. Most found  $\frac{dy}{dx}$  successfully, though a significant minority swapped  $x$  and  $y$ . In this case, they could still obtain the displayed equation successfully, but in both categories, there were frequent sign errors when differentiating trigonometric functions. Most then attempted using the displayed result to find  $f(\theta)$ , either by separating variables or using an integrating factor and got as far as  $f(\theta) = \left(\frac{k \cos^2 \theta}{1 + \sin \theta}\right)$  but then more than half got stuck. Most plotted the two given curves relatively correctly, but then a substantial number used guesswork having not previously obtained  $C$  correctly.



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