



## STEP II, 2014, Q2 EC

### Question 2

This was one of the more popular questions of the paper. Most candidates successfully showed that the first inequality was satisfied, but when producing counterexamples, some failed to show that either  $f(x) \neq 0$  or  $f(\pi) \neq 0$  for their chosen functions. In the second part many candidates did not attempt to choose values of  $a$ ,  $b$  and  $c$ , but substituted the general form of the quadratic function into the inequality instead. In the case where the function involved trigonometric functions, many of those who attempted it were able to deduce that  $p = q = -r$ , but several candidates made mistakes in the required integration. Those who established two inequalities were able to decide which gives the better estimate for  $\pi$ .



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