

STEP III, 2016 , Q3 EC

Question 3

Marginally less popular than question 2, this was very slightly better attempted. In both parts, candidates successfully equated the differential of the expressions on the right of the equations to the expression to be integrated, with the exponential function cancelled. In the first part, many obtained $P(x)$ in the given case of $Q(x)$, but the attempted proofs that the degree of $P(x)$ is one more than that of $Q(x)$ and for part (ii) that no such polynomials exist led to many illogical steps. Many would have benefited by multiplying up by denominators and using the remainder/factor theorem, rather than attempting arguments based on degrees of rational expressions. Some subverted part (i) by successfully integrating the first expression.



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