

STEP II, 2018, Q8 EC

This was the third most popular question on the paper and a number of very good responses were seen from candidates.

Most candidates were able to apply the given substitution to the differential equation and then separated the variables successfully. Candidates adopted a range of approaches to solving the differential equation, such as use of an integrating factor or a solution by finding a complementary function and then a particular integral. Success was seen with all of these methods. Some candidates omitted the constant of integration and then were unable to reach the correct answer.

In the second part of the question most candidates were able to spot a suitable substitution and proceeded to solve the differential equation successfully. The best candidates spotted the similarity to part (i) and therefore saved some time on this part by modifying the answer to (i) rather than working through all of the steps again.

The final part of the question was the least well answered. Although most candidates realised that $y_1(x) > y_2(x)$, many did not justify this or substituted a value to check rather than demonstrating that it was true for all values. Many candidates also failed to recognise that the gradient should be 0 at the origin for both curves.



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