

STEP III, 2015 , Q7 EC

7. This was as successful as question 2 and so was third equal most popular and second equal most successful. Usually the very first result was comfortably answered, but there were many flaws in part (i) as many could not carry out a proper formal induction. In part (ii), which saw a lot fall by the wayside, some candidates thought that x commutes with $\frac{d}{dx}$, and often, candidates invented random formulae for $D^n(1-x)^m$ from looking at the first few cases. Not surprisingly, working towards a given result, many came up with the correct result, but through spurious working such as substituting $x = 1$ in $(1-x)^m$ before using the differential operator.



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