

STEP III, 1999, Q13

- 13 The cakes in our canteen each contain exactly four currants, each currant being randomly placed in the cake. I take a proportion X of a cake where X is a random variable with density function

$$f(x) = Ax$$

for $0 \leq x \leq 1$ where A is a constant.

- (i) What is the expected number of currants in my portion?
- (ii) If I find all four currants in my portion, what is the probability that I took more than half the cake?



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