

STEP III, 2012 Q12 MS

12. The sketched region contained by AB, and the two line segments connecting A and B to the centre of the triangle. A simple approach for the pdf is via $P(X > x) \propto \left(\frac{1}{3} - x\right)^2$, finding the constant of proportionality and then differentiating to give the required result. $E(X) = \frac{1}{9}$.

For the second part, $g(x) = 192 \left(\frac{1}{4} - x\right)^2$, and so $E(X) = \frac{1}{16}$.



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