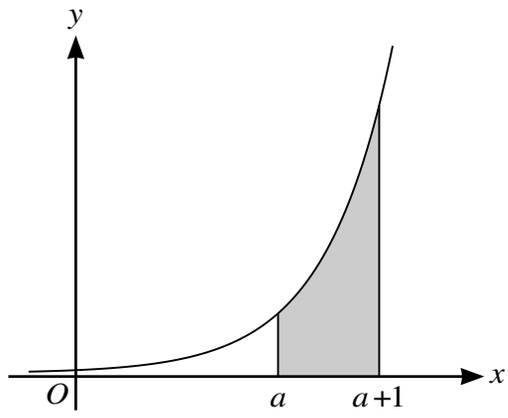

The diagram shows the curve $y = 3e^{2x-1}$. The shaded region is bounded by the curve and the lines $x = a$, $x = a + 1$ and $y = 0$, where a is a constant. It is given that the area of the shaded region is 120 square units.

(a) Show that $a = \frac{1}{2}\ln(80 + e^{2a-1}) - \frac{1}{2}$. [5]

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(b) Use an iterative formula, based on the equation in part **(a)**, to find the value of a correct to 3 significant figures. Give the result of each iteration to 5 significant figures. [3]

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