Exercise 3

Paper 2 style · Graphic display calculator

3 5 marks SL 5.5 ●●○ Typical

Let $f(x) = e^{0.5x} - 2$, for $0 \leq x \leq 3$.

(a) Find the x-intercept of the graph of f. **[1]**

(b) Find $\int_0^3 f(x)\,dx$. **[1]**

(c) Find the total area of the regions enclosed by the graph of f, the x-axis and the lines $x = 0$ and $x = 3$. **[3]**

The markscheme is on the next page: try the question first. Written and verified by a practising IB mathematics teacher, produced with AI assistance; solved twice and recomputed by software. Not affiliated with or endorsed by the International Baccalaureate Organization.
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MARKSCHEME (a)

$x = 1.39 \quad (2\ln 2 = 1.38629\ldots)$ **A1**

Total 1 mark

MARKSCHEME (b)

$0.963 \quad (0.963378\ldots)$ **A1**

Total 1 mark

MARKSCHEME (c)

$\int_0^3 |e^{0.5x} - 2|\,dx$ **(M1)**

$= 2.51 \quad (2.50855\ldots)$ **A2**

Total 3 marks

Note The region from 0 to 1.39 is below the axis: the integral of (b) is not the area.