Exercise 3

Paper 2 style · Graphic display calculator

3 5 marks SL 5.5 ●●○ Typical

Let $f(x) = x\,\mathrm{e}^{-0.5x}$.

(a) Find $\int_0^4 f(x)\,\mathrm{d}x$. **[2]**

(b) Hence find $\int_0^4 \left(3f(x) - 1\right)\mathrm{d}x$. **[2]**

(c) Write down $\int_4^0 f(x)\,\mathrm{d}x$. **[1]**

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)

$\int_0^4 x\,\mathrm{e}^{-0.5x}\,\mathrm{d}x$ on the GDC **(M1)**

$= 2.38 \quad (2.37597\ldots)$ **A1**

Total 2 marks

MARKSCHEME (b)

$3 \times 2.37597\ldots - 4$ **M1**

$= 3.13$ **A1**

Total 2 marks

Note $\int_0^4 1\,\mathrm{d}x = 4$.

MARKSCHEME (c)

-2.38 **A1**

Total 1 mark