Marked example 1

Paper 1 style · No calculator

1 5 marks SL 2.9 ●○○ Routine

Let $f(x) = 5 - 2\,e^{-x}$.

(a) Write down the y-intercept of the graph of f. **[1]**

(b) Write down the equation of the horizontal asymptote of the graph of f. **[1]**

(c) Write down the range of f. **[1]**

(d) Find the exact x-intercept of the graph of f. **[2]**

MARKSCHEME (a)

3 **A1**

Total 1 mark

MARKSCHEME (b)

$y = 5$ **A1**

Total 1 mark

MARKSCHEME (c)

$f(x) < 5$ **A1**

Total 1 mark

Note $-2e^{-x}$ is always negative: the graph stays below its asymptote.

MARKSCHEME (d)

$e^{-x} = \frac{5}{2}$ **(M1)**

$x = -\ln\frac{5}{2}$ **A1**

Total 2 marks

Note Accept $\ln\frac{2}{5}$ or $\ln 0.4$.

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