Exercise 3

Paper 2 style · Graphic display calculator

3 5 marks SL 1.7 ●●○ Typical

Answer the following.

(a) Solve $2^{x+3} = 7^x$. **[3]**

The number of members of a club t years after 2020 is modelled by $M = 800 \times 1.06^t$.

(b) Find the number of years after 2020 when the number of members first reaches 1500. **[2]**

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)

$(x+3)\ln 2 = x\ln 7$ **M1**

$x = \dfrac{3\ln 2}{\ln 7 - \ln 2}$ **(A1)**

$x = 1.66 \ \ (1.65988\ldots)$ **A1**

Total 3 marks

Note Or the GDC.

MARKSCHEME (b)

$800 \times 1.06^t = 1500$ **(M1)**

$t = 10.8$ years $\ \ (10.7881\ldots)$ **A1**

Total 2 marks

Note Accept 11 years if the answer is given in whole years with a reason.