Marked example 3

Paper 2 style · Graphic display calculator

3 5 marks SL 1.7 ●●○ Typical

Answer the following.

(a) Solve $3^{x+1} = 5^x$. **[3]**

The population of a town t years after 2020 is modelled by $P = 1200 \times 1.04^t$.

(b) Find the number of years after 2020 when the population first reaches 2000. **[2]**

MARKSCHEME (a)

$(x+1)\ln 3 = x \ln 5$ **M1**

$x = \dfrac{\ln 3}{\ln 5 - \ln 3}$ **(A1)**

$x = 2.15 \ \ (2.15066\ldots)$ **A1**

Total 3 marks

Note Or the GDC.

MARKSCHEME (b)

$1200 \times 1.04^t = 2000$ **(M1)**

$t = 13.0$ years $\ \ (13.0243\ldots)$ **A1**

Total 2 marks

Note Accept 14 years if the answer is given in whole years with a reason.

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