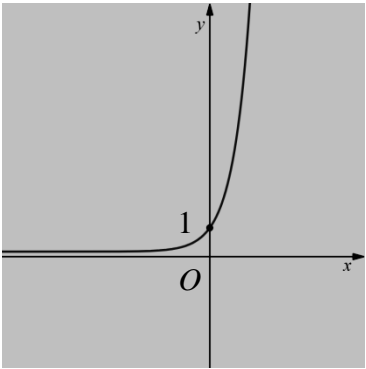


Question	Scheme	Marks	AOs	
2(a)		Correct shape or correct intercept – see notes	B1	1.2
		Fully correct – see notes	B1	1.1b
		(2)		
(b)	$4^x = 100 \Rightarrow x = \log_4 100$ <p style="text-align: center;">or</p> $\text{e.g. } x \log 4 = \log 100 \Rightarrow x = \frac{\log 100}{\log 4}$	M1	1.1b	
	$\Rightarrow (x =) \text{awrt } 3.32$	A1	1.1b	
		(2)		
			(4 marks)	

Notes:

Note that B0B1 is not possible in part (a)

(a) Axes do not need to be labelled. No sketch is no marks.

B1: Correct shape or correct intercept.

Shape: A positive exponential curve in quadrants 1 and 2 only, passing through a point on the positive y-axis. Must “level out” in quadrant 2 but not necessarily asymptotic to the x-axis and allow if the curve bends up slightly for $x < 0$ but do not allow a clear “U” shape. It must not clearly “stop” on the x-axis to the left of the y-axis.

OR

Intercept: The intercept can be marked as 1 or (0, 1) or $y = 1$ or (1, 0) as long as it is in the correct place. May also be seen away from the sketch but must be seen as (0, 1) or possibly these coordinates in a table but it must correspond to the sketch. If there is any ambiguity, the sketch takes precedence.

B1: Fully correct.

Shape: A positive exponential curve in quadrants 1 and 2 only, passing through a point on the positive y-axis. The curve must appear to be asymptotic to the x-axis **and it must level out at least half way below the intercept**. Allow if the curve bends up slightly for $x < 0$ but do not allow a clear “U” shape. The curve must not bend back on itself on the rhs of the y-axis. There must be no suggestion that the curve approaches another horizontal asymptote other than the x-axis e.g. a horizontal dotted line that the curve approaches.

AND

Intercept: As above

See practice items and below for some examples:

(b)

M1: Uses logs in an attempt to solve the equation. E.g. takes log base 4 and obtains $x = \log_4 100$

Alternatively takes logs (any base) to obtain $x \log 4 = \log 100$ and proceeds to $x = \frac{\log 100}{\log 4}$

Allow if this subsequently becomes e.g. $\log 25$ as long as $\frac{\log 100}{\log 4}$ is seen **but**

$x \log 4 = \log 100 \Rightarrow x = \log 25$ or $x \log 4 = \log 100 \Rightarrow x = \log 100 - \log 4$ scores M0

A1: awrt 3.32 . A correct answer only of awrt 3.32 scores M1A1

Note that a common incorrect answer is $x = 3.218875\dots$ and comes from $\ln 25$ or $\ln 100 - \ln 4$

and unless $x = \frac{\ln 100}{\ln 4}$ is seen previously, this scores M0A0