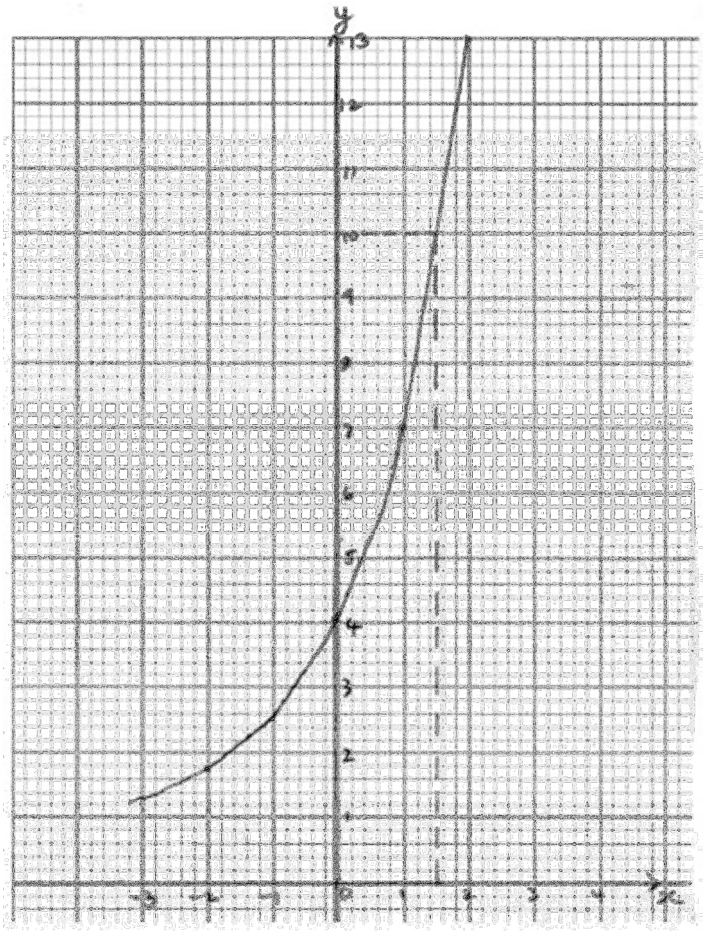
# Exponential Functions IB Answers

**1.** (a) $a = 2.5$, $b = 13$ (A1)(A1) 2

(c) (A4) 4



***Note:*** *Award (A1) for scales and labels, (A2) for all points accurate ((A1) for 5 correct), (A1) for smooth curve.*

(c) Range $f(x) > 1$

($y > 1$) (A2) 2

***Note:*** *Award (A1) for f (x) >, (A1) for 1.*

(d) $x = 1.6$ ($\pm$ 0.1) (M1)(A1) (or (G2)) 2

***Note:*** *Answer by calculation is 1.58.*

**[10]**

**2.** (a) (i) $y = 3^{-0} + 2$ (M1)
$y = 1 + 2$ (A1)
$a = 3$ (A1) (C3)

(ii) $y = 3^{-1} + 2$ (M1)
$y = \frac{1}{3} + 2$ (A1)
$b = 2\frac{1}{3}$ (A1)
(C3)

(b) $y = 2$ (A2)
(C2)

***Note:*** *Award (A1) for y = any constant.*

**[8]**

**3.** (a) (0,1) (A2)(A2)
(C4)

(b) $16 = a^4$ (M2)
$a = 2$ (A2)
(C4)

**[8]**

**4.** (a) $85 \pm 1$ (M1)(A1)(C2)

(b) $21.5 \pm 0.5$ (M1)(A1)(C2)

(c) $y = 100 \times (5^{-0.02\times80})$
$= 7.61$ (M1)(A1)(C2)

(d) $y = 0$ (A1)(A1)(C2)

***Note:*** *Award (A1) for y = and (A1) for 0.*

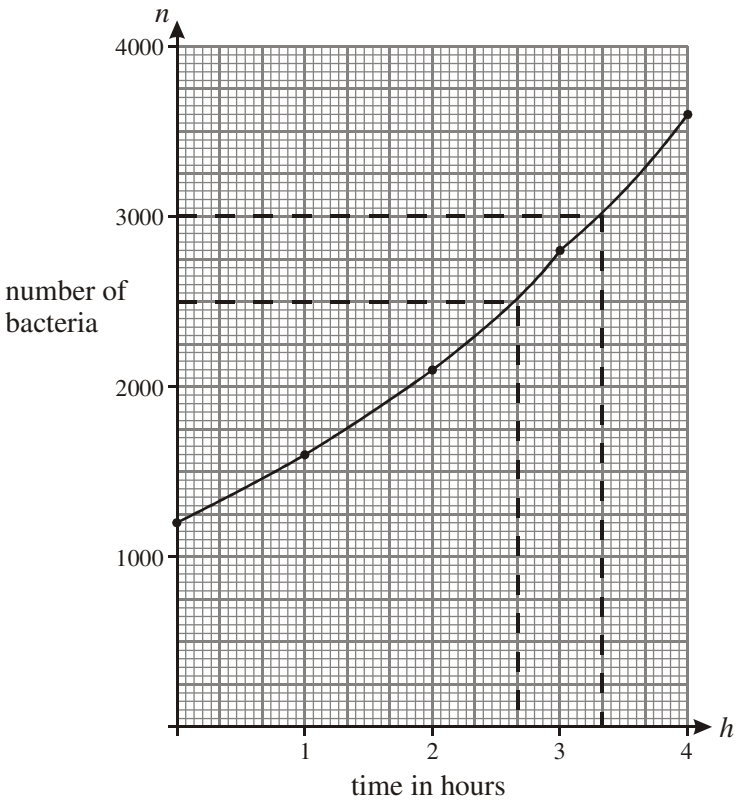
**[8]**

**5.** (a)

| Time in hours *(h)* | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| No. of bacteria *(n)* | 1200 | **1600** | 2100 | 2700 | **3600** |

(A1)(A1) 2

(b)




(A2)(A3) 5

***Note:*** *Award (A1) for the axes correctly labelled and (A1) for the correct scales.*

*Award (A2) for 4 or 5 points correctly plotted, (A1) for 2 or 3 correct and (A1) for connecting points with a smooth curve.*

(c) (i) 2500 (M1)(A1)

(ii) 3hrs 20min (M1)(A1) 4

***Note:*** *Use follow through from graph. If no method is shown from graph give (C1) only for correct answer.*

**[11]**

**6.** (a) $N = 150 \times 2^0 = 150$ (A1)(C1)

(b) $N = 150 \times 2^3 = 1200$ (A1)(C1)

(c) $19200 = 150 \times 2^t$ (M1)

$128 = 2^t$

$7 = t$ (A1)(C2)

**[4]**