

GCSE QUESTIONS WITH CLUES

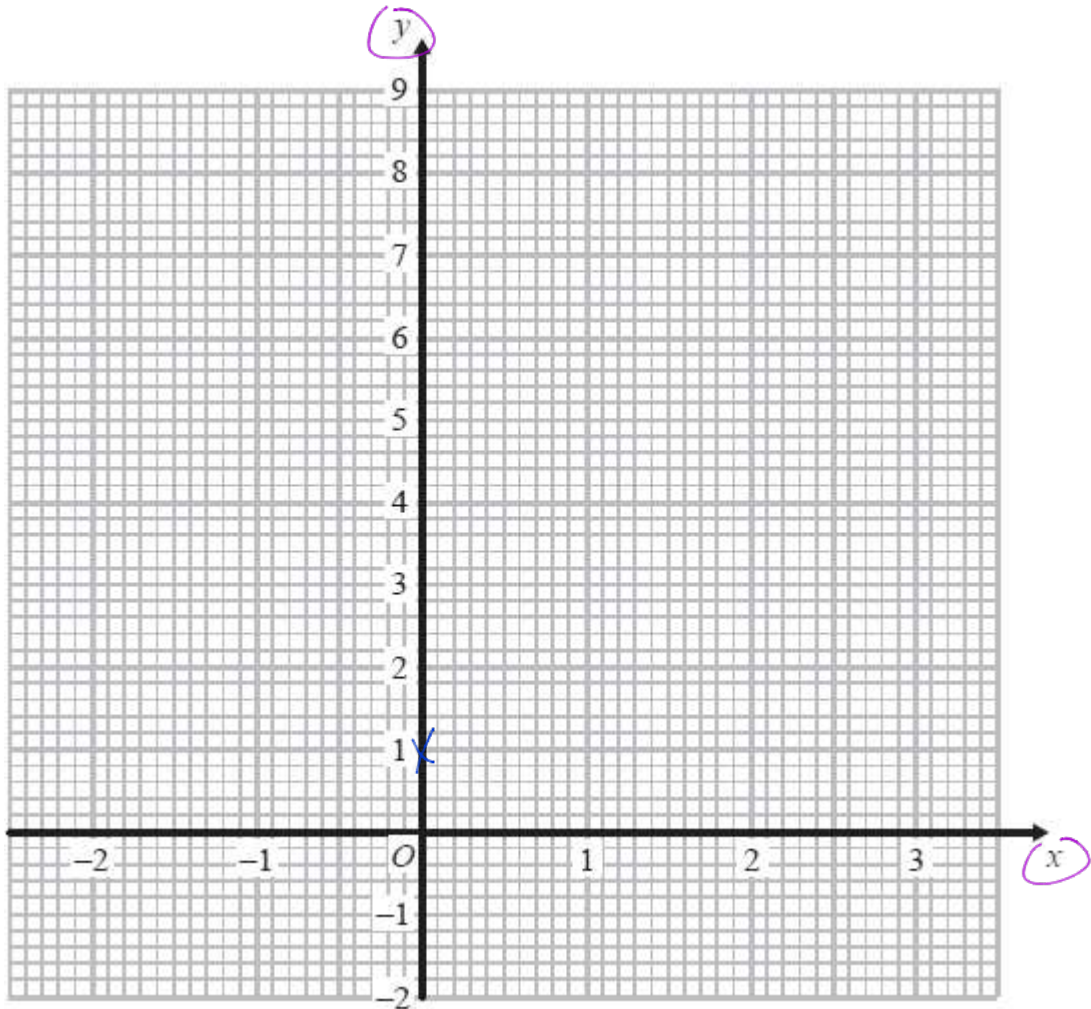
Q1. NON-CALCULATOR

(a) Complete the table of values for $y = 2^x$

x	-2	-1	0	1	2	3
y	0.25		1	2		

2^{-1} 2^0 2^2 2^3 (2)

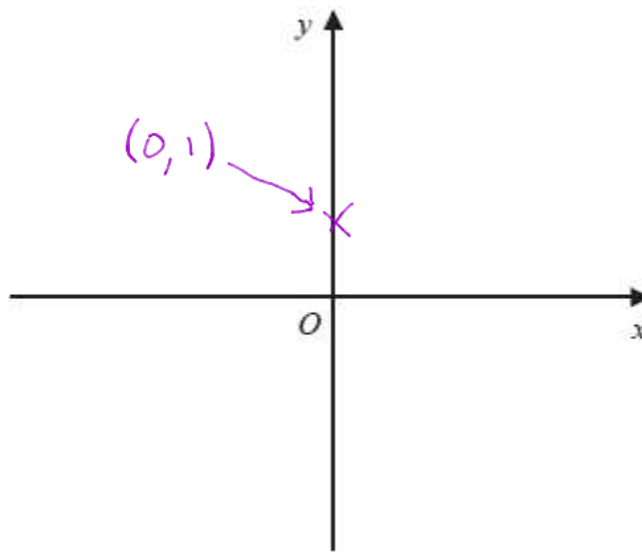
(b) On the grid, draw the graph of $y = 2^x$ for values of x from -2 to 3



(2)
(Total for question = 4 marks)

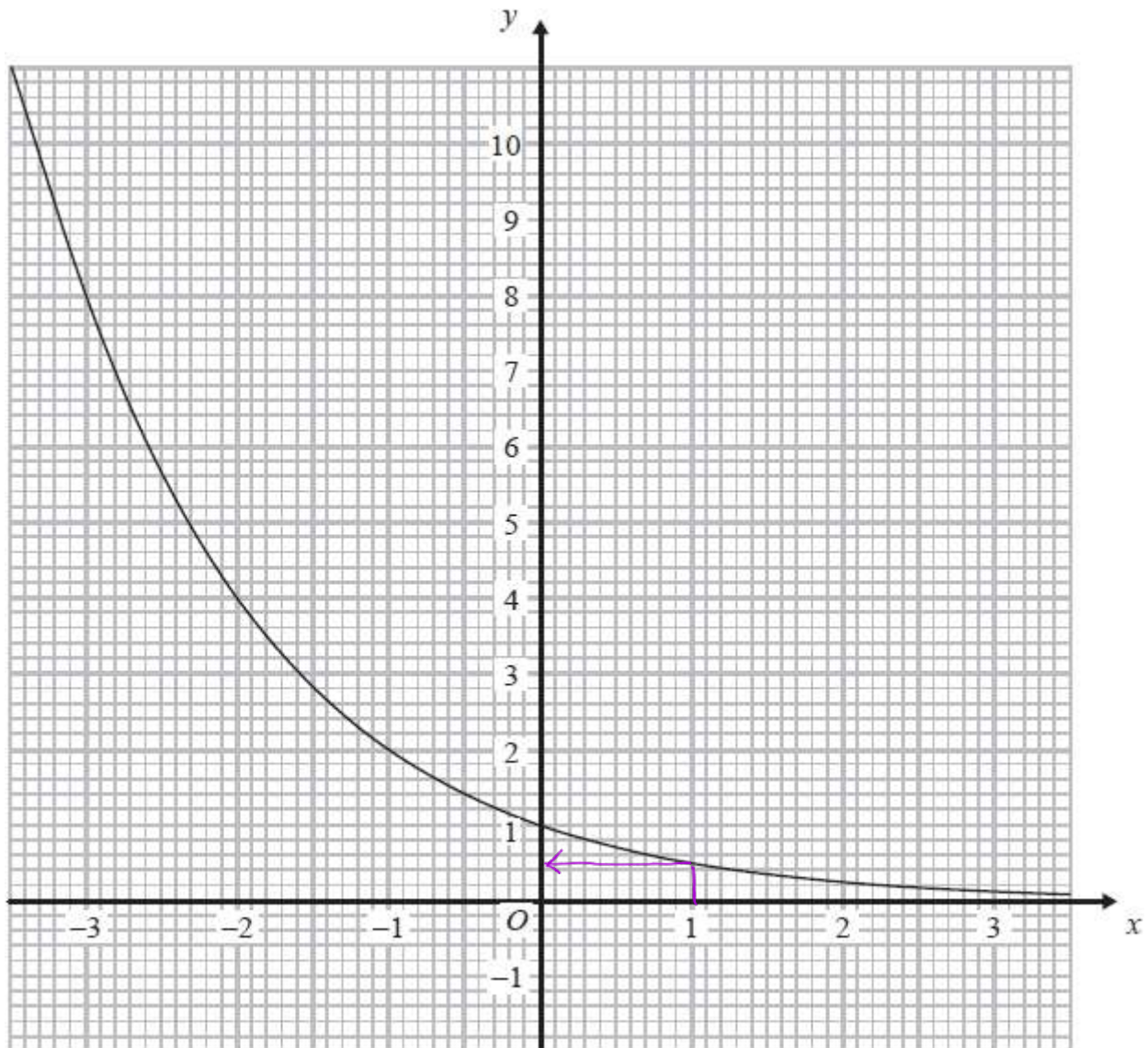
Q2. CALCULATOR ALLOWED

On the grid, sketch the curve with equation $y = 2^x$
Give the coordinates of any points of intersection with the axes.



(Total for question = 2 marks)

Q3. CALCULATOR ALLOWED



The graph of $y = k^x$, where k is a positive constant, is shown above.

Find the value of k .

When $x=1$, $y=k^x$

$k = \dots\dots\dots$

(Total for question = 2 marks)

Q4. CALCULATOR ALLOWED

Louis and Robert are investigating the growth in the population of a type of bacteria. They have two flasks A and B.

At the start of day 1, there are 1000 bacteria in flask A.

The population of bacteria grows exponentially at the rate of 50% per day.

'sequence'

(a) Show that the population of bacteria in flask A at the start of each day forms a geometric progression.



Ratio: $\frac{\dots}{\dots} = \frac{\dots}{\dots} =$ (2)

The population of bacteria in flask A at the start of the 10th day is k times the population of bacteria in flask A at the start of the 6th day.

(b) Find the value of k .

$$k = \frac{1000 \times 1.5^{10}}{1000 \times 1.5^6}$$

$$= \frac{1.5^{10}}{1.5^6}$$

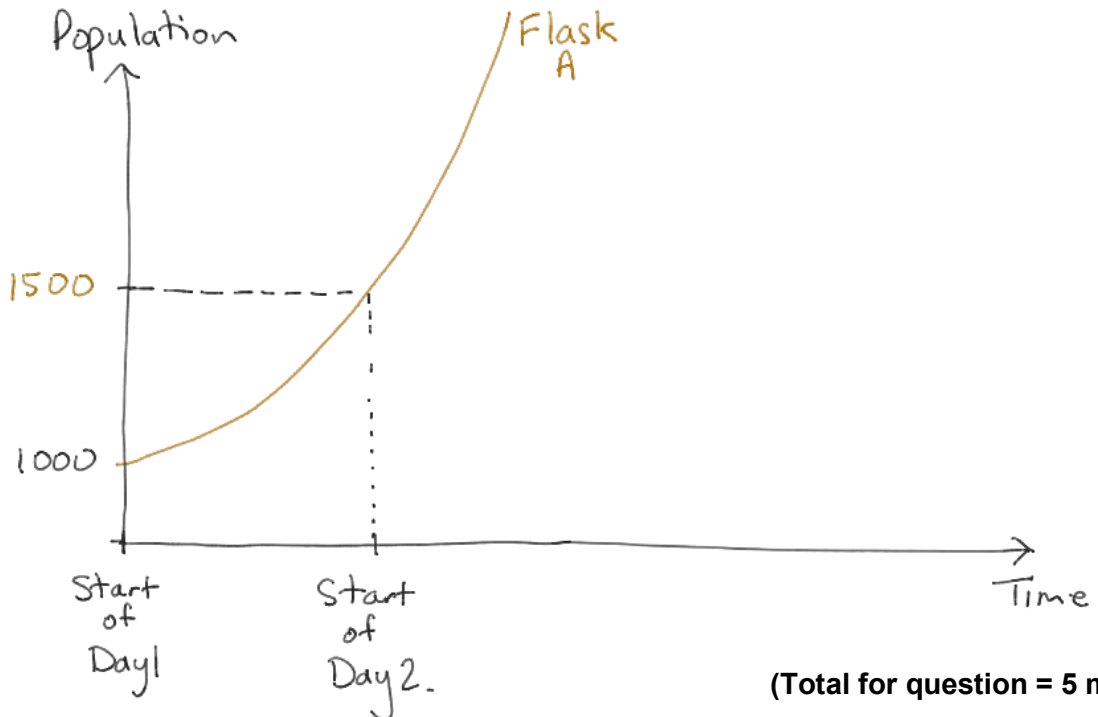
$\dots\dots\dots$ (2)

At the start of day 1 there are 1000 bacteria in flask B.

(so 1300 on Day 2)

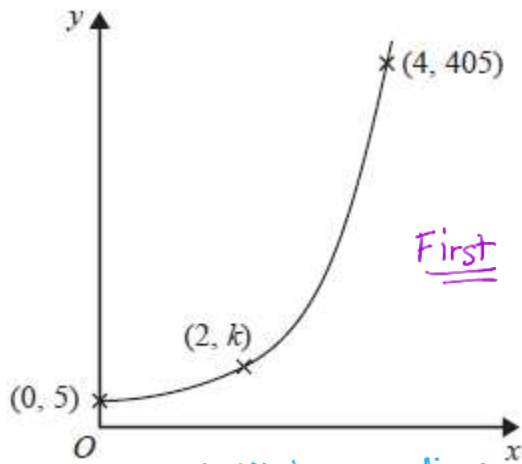
The population of bacteria in flask B grows exponentially at the rate of 30% per day.

(c) Sketch a graph to compare the size of the population of bacteria in flask A and in flask B.



(1)
(Total for question = 5 marks)

Q5. CALCULATOR ALLOWED



Here is a sketch of part of the graph of $y = pq^x$ where $q > 0$

The points $(0, 5)$, $(2, k)$ and $(4, 405)$ are all on the graph of $y = pq^x$

Find the value of k .

First

Substitute coordinate set ①:

$$y = pq^x$$

$$y = 5$$

$$5 = pq^0$$

$$5 = p$$

Second, substitute coordinate ②:

$$x = 4$$

$$y = 405$$

Lastly, substitute coordinate ③:

$$x = 2$$

$$y = k$$

(Total for question = 4 marks)

Q6. CALCULATOR ALLOWED

The equation of a curve is $y = a^x$
 A is the point where the curve intersects the y-axis.

(a) State the coordinates of A.

$$y = a^x$$



(..... ,)

(Total for question = 1 mark)