A74 (H) Exponential Graphs - Sketching

OCR

Video created by W Neill

4 Rashid invests money into an account which pays a fixed rate of compound interest each year.
The value, £V, of his investment after t years is given by the formula

R11

$$V = 1250 \times 1.03^t.$$

(a) How much money did Rashid invest?

(a) £ ..... **[1]**

(b) What rate of compound interest is paid each year?

(b) ..... % **[1]**

(c) Circle the graph that best represents the growth in Rashid's account.

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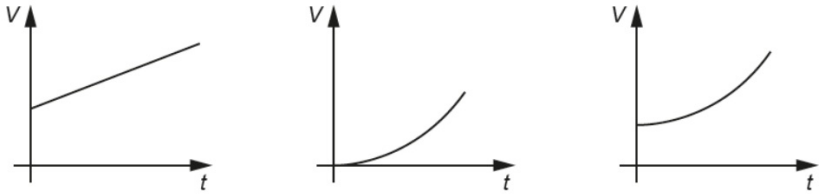

Video created by W Neill

4 Rashid invests money into an account which pays a fixed rate of compound interest each year.
The value, £V, of his investment after t years is given by the formula

R11

$$V = 1250 \times 1.03^t.$$

100%

(a) How much money did Rashid invest?

(a) £ 1250 **[1]**

(b) What rate of compound interest is paid each year?

0.03 = 3%

(b) 3 % **[1]**

(c) Circle the graph that best represents the growth in Rashid's account.

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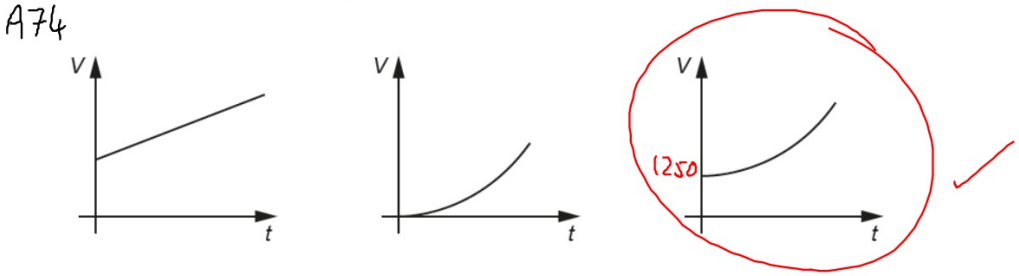

21 The number of gannets on an island is assumed to follow this exponential growth model.

$$N = 0.45 \times 1.07^{x}$$

N is the number of gannets, in thousands.
x is the number of years after 1st January 2010.

(a) Complete the table for $N = 0.45 \times 1.07^{x}$.

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R31

x	0	5	10	15	20
N	0.45	0.63		1.24	

[2]

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x	0	5	10	15	20
N	0.45	0.63		1.24	

(b) Draw the graph of $N = 0.45 \times 1.07^x$. **[2]**

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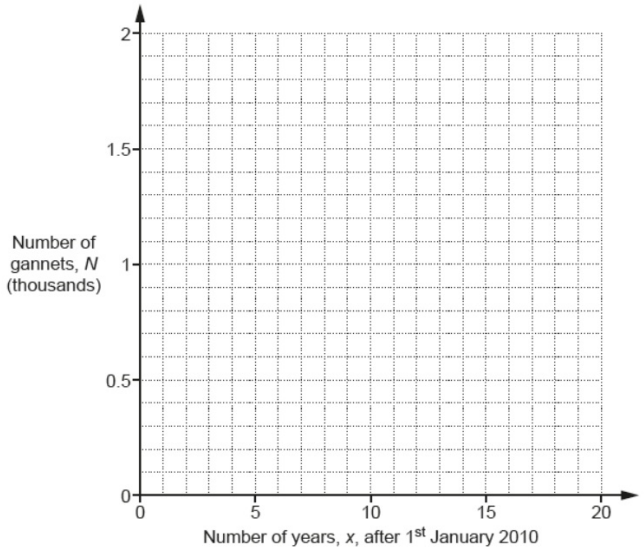

(c) Use the graph to find **the year** when the gannet population is predicted to reach 1000.

(c) ..... **[2]**

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21 The number of gannets on an island is assumed to follow this exponential growth model.

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A74
R31

x	0	5	10	15	20
N	0.45	0.63	0·89	1.24	1·74

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Video created by W Neill

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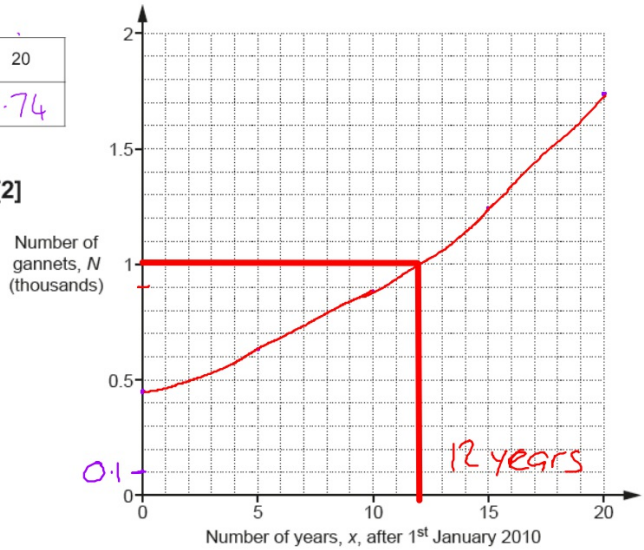
A74



2010 + 12 yrs

(c) Use the graph to find **the year** when the gannet population is predicted to reach 1000.

(c) 2022 ..... **[2]**

EDEXCEL

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

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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.

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

(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.

.....

(2)

At the start of day 1 there are 1000 bacteria in flask B.
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 17 is 5 marks)

Video created by W Neill

17 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.

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

(A) Start

1000×1.5^{x} → day

↘ +50%.

.... geometric progression
it has a constant ratio.

(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.

1 2 3 4 5 6 7 8 9 10

1000 1500

7593.75 38443.3593

1000×1.5

×5.0625

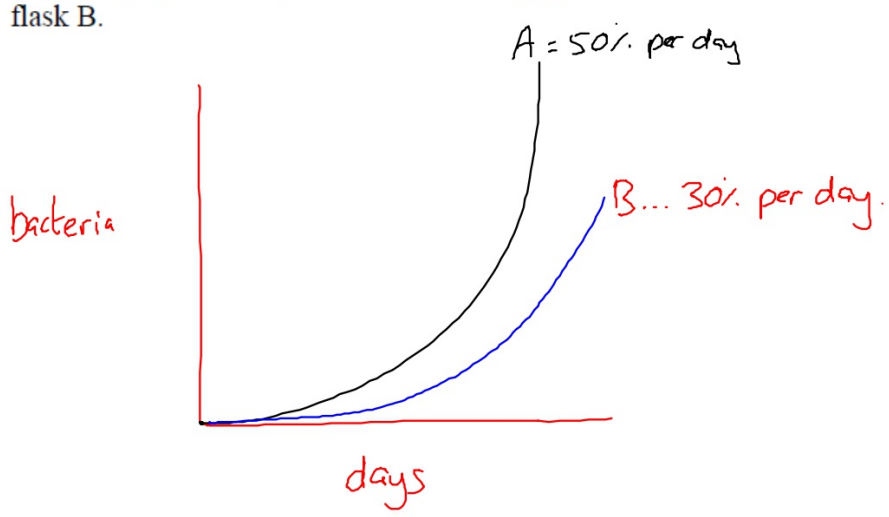
5.0625

(2)

Video created by W Neill

At the start of day 1 there are 1000 bacteria in flask B.
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 17 is 5 marks)

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

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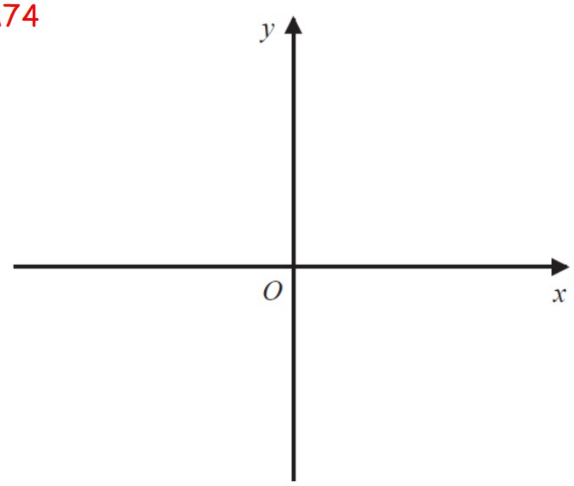
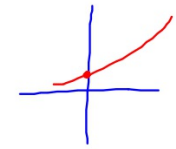


(Total for Question 14 is 2 marks)

14 On the grid, sketch the curve with equation $y = 2^x$ exponential

Give the coordinates of any points of intersection with the axes.



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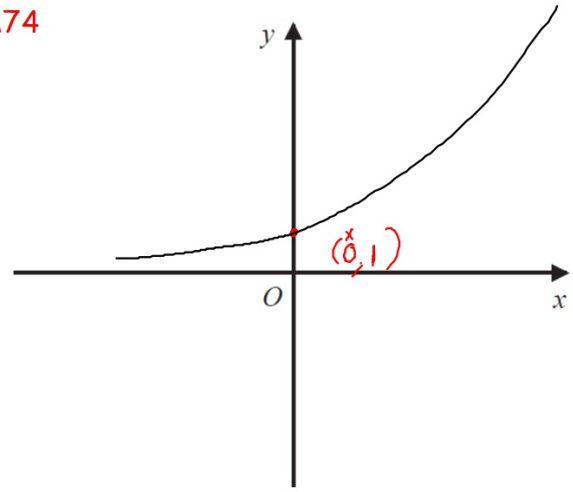


$y = 2^0$

$= 1$

(Total for Question 14 is 2 marks)

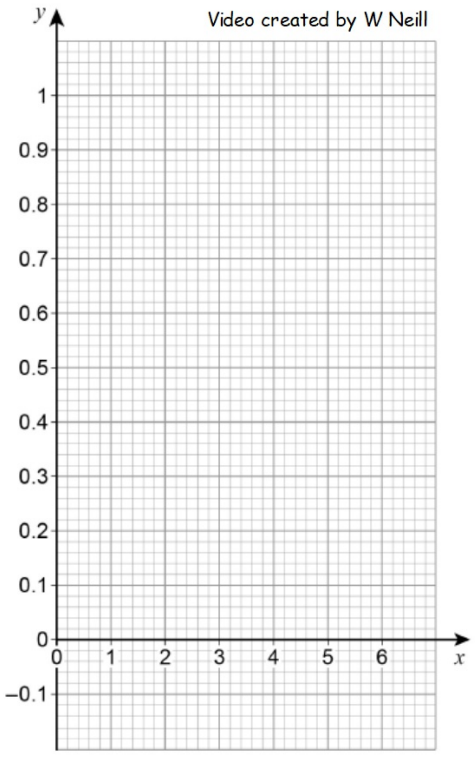
AQA

14 Draw the graph of $y = 0.8^x$ for values of x from 0 to 6

A74

x	0	1	2	3	4	5	6
y							

[3 marks]



14 Draw the graph of $y = 0.8^x$ for values of x from 0 to 6

A74

x	0	1	2	3	4	5	6
y	1	0·8	0·64	0·512	0·4096		0·2621

[3 marks]

0·32768