

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson  
Edexcel Award**

Centre Number

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Candidate Number

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**Monday 11 January 2021**

Morning (Time: 1 hour 30 minutes)

Paper Reference **AAL20/01**

**Algebra**

**Level 2**

**Calculator NOT allowed**

**You must have:** Ruler graduated in centimetres and millimetres,  
pen, HB pencil, eraser.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators are not allowed.**



### Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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P 6 3 4 6 1 R A 0 1 2 0



Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

You must NOT use a calculator.

1 (a) Simplify  $n^4 \times n^5$

.....  
(1)

(b) Simplify  $\frac{t^7}{t}$

.....  
(1)

(c) Simplify  $(3r^2)^4$

.....  
(2)

(d) Simplify  $5 \times w \times w \times 2 \times y \times w$

.....  
(2)

(e) Simplify  $2p + 3m + p - 5 - 2m - 4$

.....  
(2)

(Total for Question 1 is 8 marks)

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2 (a) Factorise  $25 - 5g$

.....  
(1)

(b) Factorise  $9y^2 + 6y$

.....  
(2)

(c) Factorise  $16e^2m^2 - 12em^3$

.....  
(2)

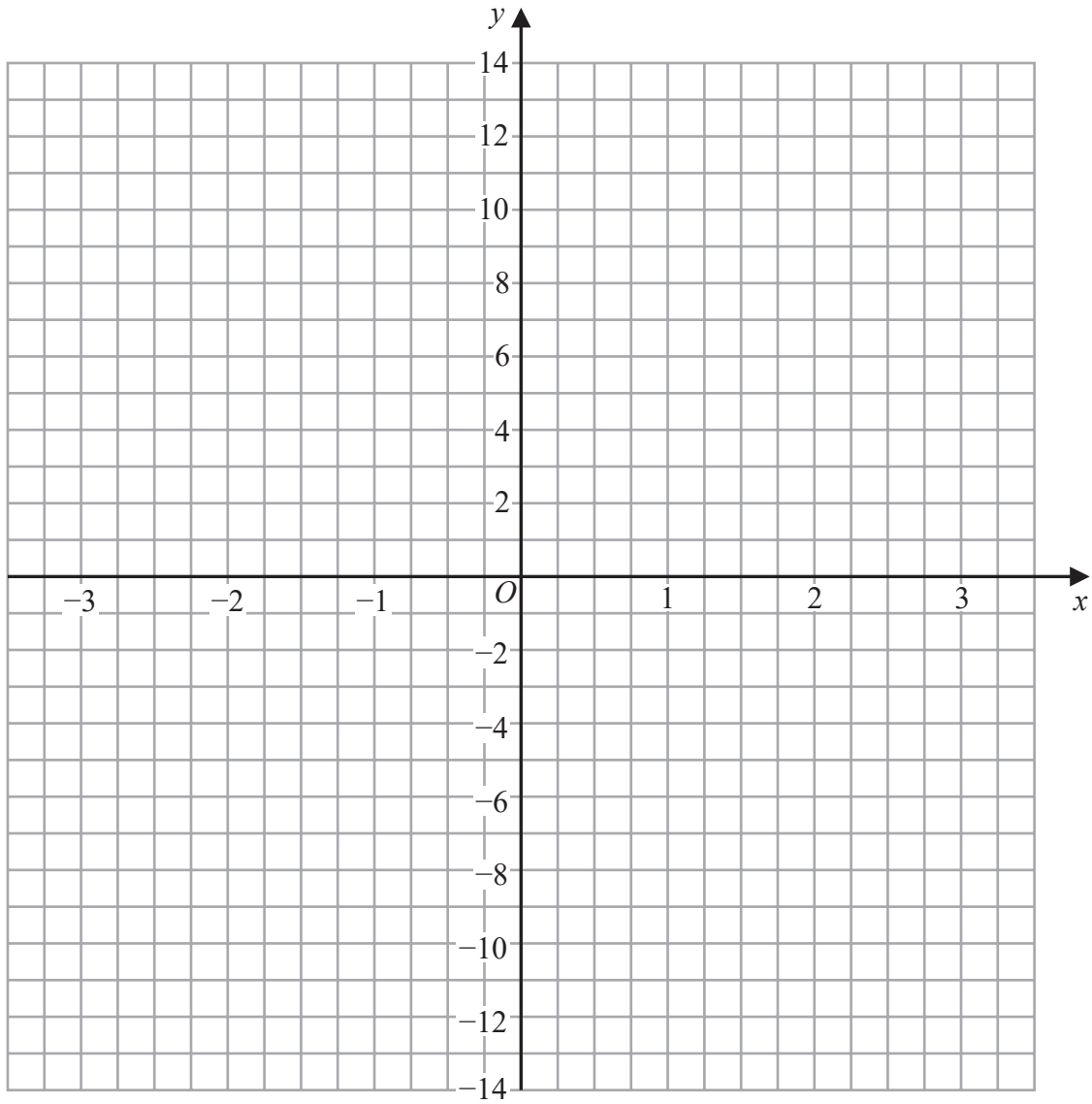
(Total for Question 2 is 5 marks)

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P 6 3 4 6 1 R A 0 3 2 0

3 On the grid, draw the graph of  $y = 3x - 4$  for values of  $x$  from  $-3$  to  $3$



(Total for Question 3 is 3 marks)

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4 (a) Solve  $2f + 5 = 11$

$f = \dots\dots\dots$   
(2)

(b) Solve  $7 + k = \frac{1}{2}k + 3$

$k = \dots\dots\dots$   
(2)

(c) Solve  $3(2x - 1) = 2(x + 5)$

$x = \dots\dots\dots$   
(3)

(Total for Question 4 is 7 marks)



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5 The  $n$ th term of a sequence is given by the expression  $3(n + 1)$

(a) Work out the first two terms of this sequence.

.....  
(2)

123 is a term of this sequence.

(b) Which term of this sequence is 123?

.....  
(2)

**(Total for Question 5 is 4 marks)**



6 (a) Expand  $u(2u + w + 3)$

.....  
(2)

(b) Expand  $4q^2(5q - q^2)$

.....  
(2)

**(Total for Question 6 is 4 marks)**

7 Place a tick in the appropriate column of the table to show whether each of the following is an equation, an expression or a formula.

	Equation	Expression	Formula
$x^2 = 36$			
$2a^2 + b^2$			
$3 - 4x = 8$			
Perimeter = $4 \times$ length of side			

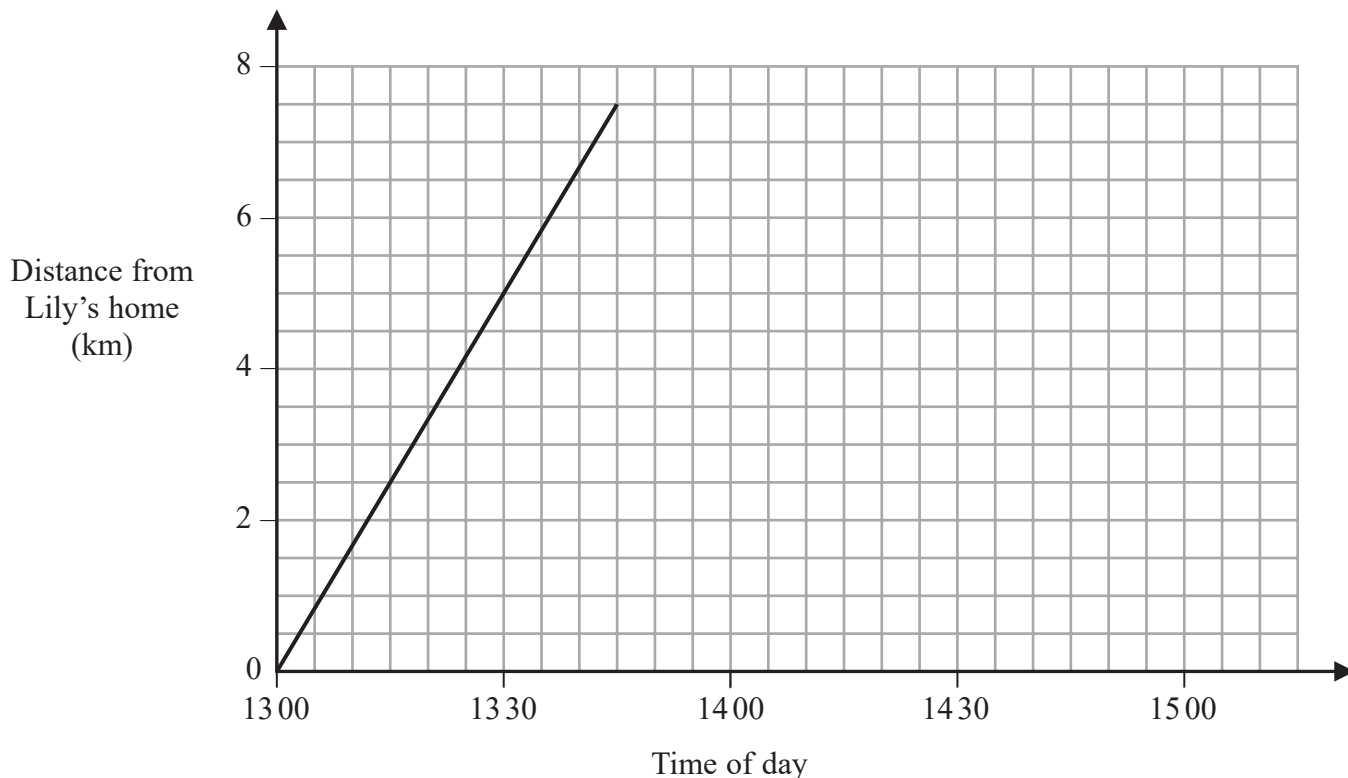
**(Total for Question 7 is 3 marks)**



8 Lily ran  $7\frac{1}{2}$  km from her home to her brother's house.

She left home at 13 00 and arrived at her brother's house at 13 45

The travel graph for Lily's journey from her home to her brother's house is shown on the grid.



(a) Work out Lily's speed for her journey from her home to her brother's house. Give your answer in km/h.

..... km/h  
(2)

Lily stayed at her brother's house for 50 minutes. She then cycled home at a steady speed. She arrived home at 15 00

(b) On the grid, draw the travel graph for this information.

(2)

(Total for Question 8 is 4 marks)



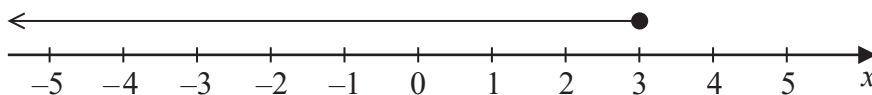


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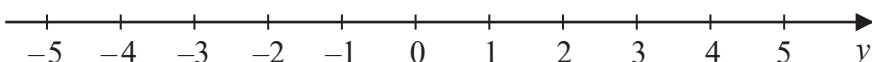
9 Here is an inequality, in  $x$ , shown on a number line.



(a) Write down the inequality.

.....  
(2)

(b) On the number line below, show the inequality  $-3 < y \leq 1$



(2)

(c)  $-2 \leq t < 4$

$t$  is an integer.

Write down all the possible values of  $t$ .

.....  
(2)

(d) Solve the inequality  $\frac{5w}{2} < 10$

.....  
(3)

(Total for Question 9 is 9 marks)



P 6 3 4 6 1 R A 0 9 2 0

10  $y = (x + 3)^2$

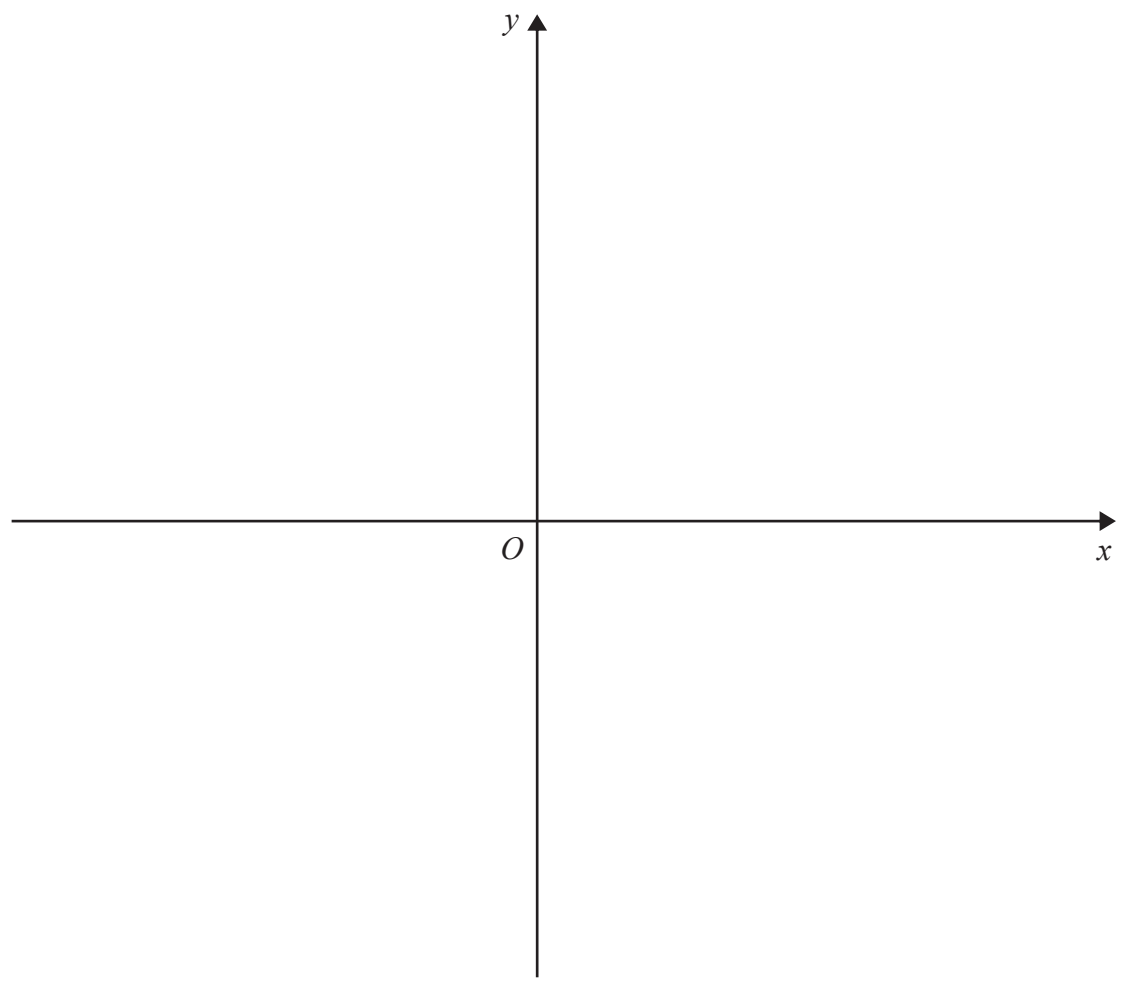
(a) (i) Work out the value of  $y$  when  $x = 0$

.....  
(1)

(ii) Work out the value of  $x$  when  $y = 0$

.....  
(1)

(b) Using the axes below, sketch the graph of  $y = (x + 3)^2$   
Show the coordinates of the points where the graph meets the axes.



(3)

(Total for Question 10 is 5 marks)



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11 Radu has  $m$  packets of biscuits.  
Each packet of biscuits contains 5 biscuits.

(a) Write down an expression in terms of  $m$  for the total number of biscuits Radu has.

.....  
(1)

Faye has  $2m$  packets of biscuits.  
Each packet of biscuits contains 3 biscuits.

(b) Write down an expression in terms of  $m$  for the total number of biscuits Faye has.  
Give your answer in its simplest form.

.....  
(1)

Radu also has  $n$  cakes.  
Faye also has  $3n$  cakes.

(c) Write down an expression in terms of  $m$  and  $n$  for the total number of biscuits and cakes that Radu and Faye have.  
Give your answer in its simplest form.

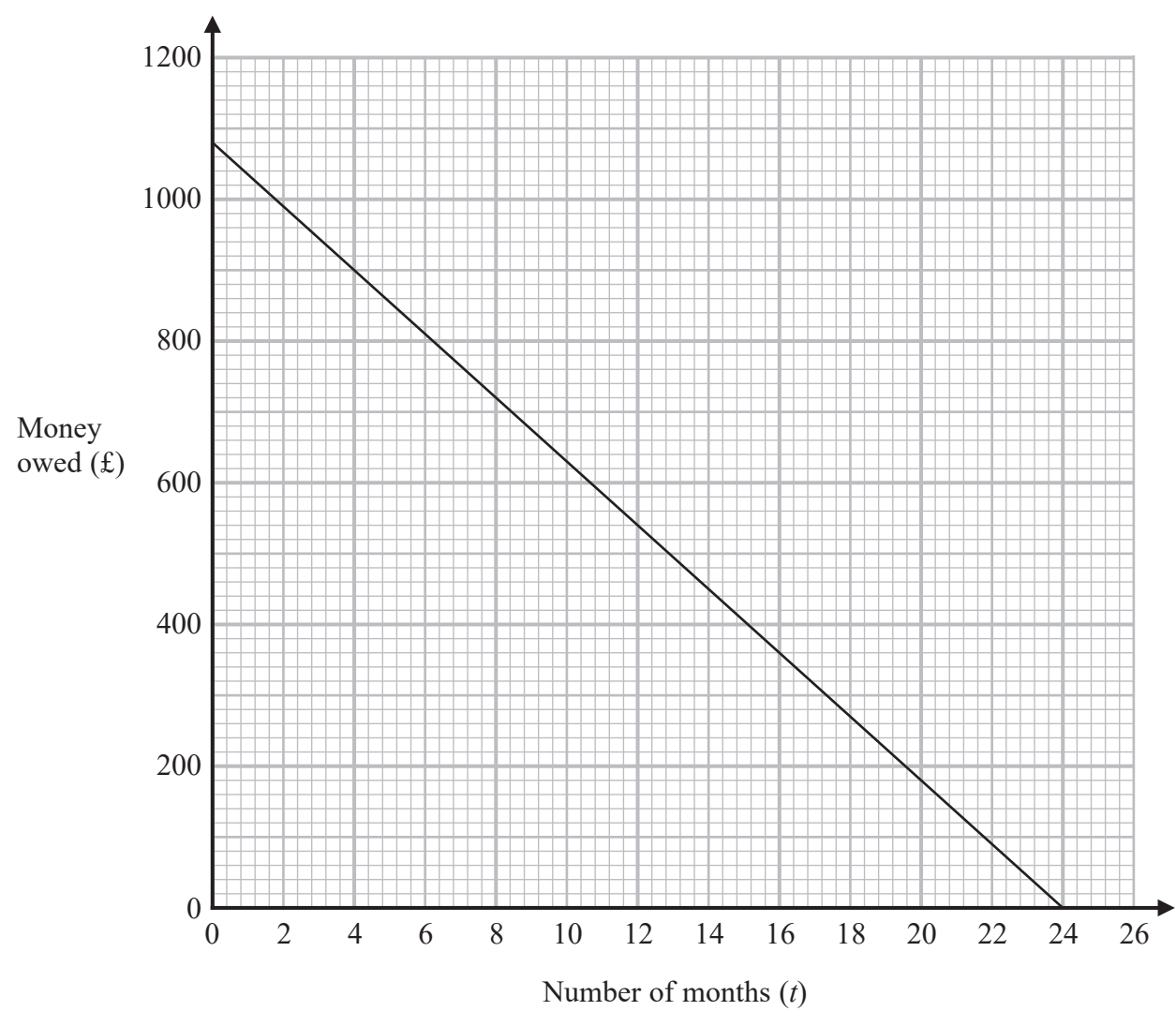
.....  
(2)

(Total for Question 11 is 4 marks)



12 Andrew borrowed some money from Philip.  
Andrew repaid this money by giving Philip a fixed amount of money each month.

This graph can be used to find how much money, in £, Andrew owed Philip  $t$  months after Andrew borrowed the money.



(a) Write down how much money Andrew borrowed from Philip.

£.....  
(1)

(b) Write down the number of months it took Andrew to repay half of the money that he borrowed from Philip.

.....months  
(1)



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(c) Work out the gradient of the straight line.

.....

(2)

(d) Explain what the gradient of the straight line represents.

.....  
.....  
.....

(1)

**(Total for Question 12 is 5 marks)**



13  $t = 5\sqrt{g - 3}$

(a) Work out the value of  $t$  when  $g = 19$

.....  
(2)

(b) Make  $g$  the subject of the formula  $t = 5\sqrt{g - 3}$

.....  
(3)

(Total for Question 13 is 5 marks)

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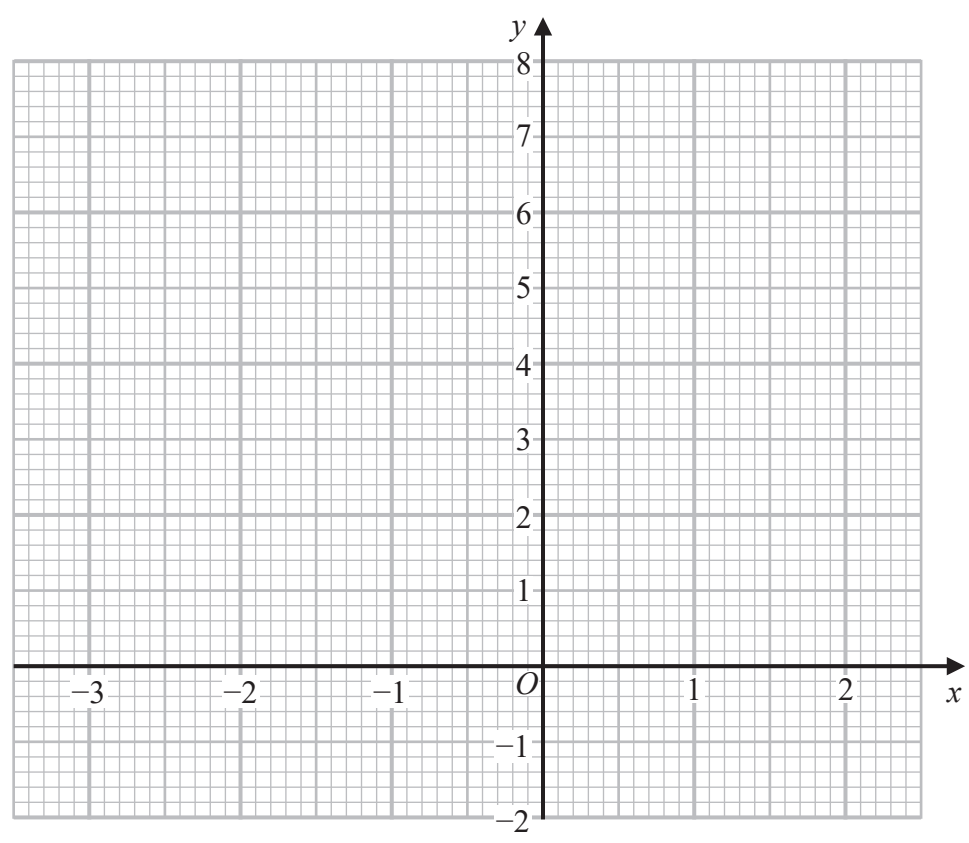
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14 (a) Complete the table of values for  $y = x^2 + x + 1$

$x$	-3	-2	-1	0	1	2
$y$		3		1		

(2)

(b) On the grid, draw the graph of  $y = x^2 + x + 1$  for values of  $x$  from -3 to 2



(2)

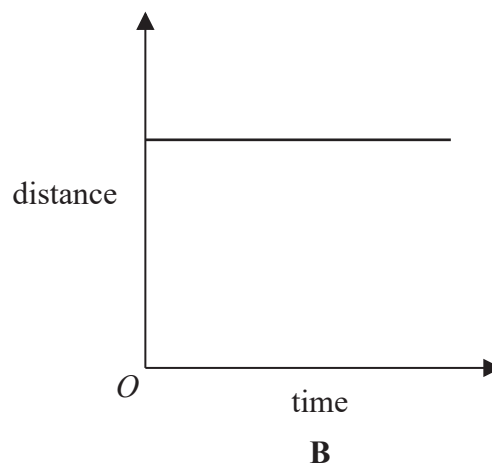
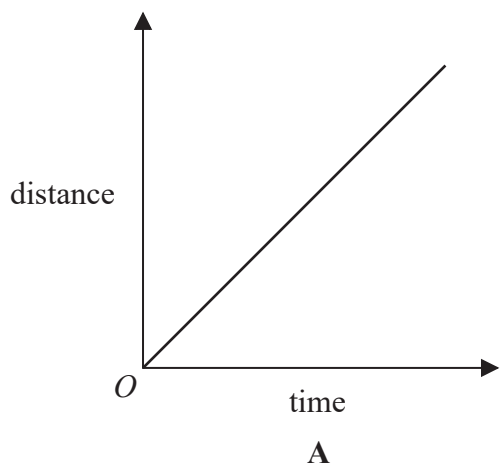
(c) Use your graph to find estimates for the solutions of  $x^2 + x + 1 = 6$

(2)

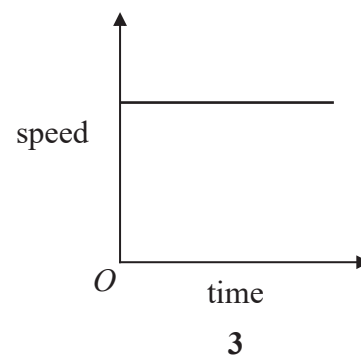
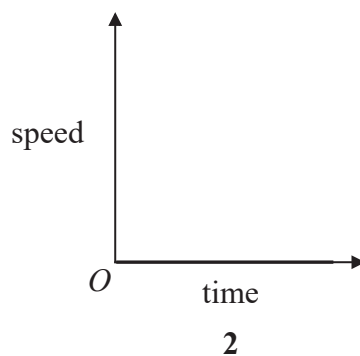
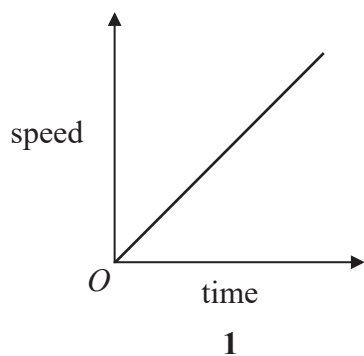
(Total for Question 14 is 6 marks)



15 Here are two distance-time graphs.



Here are three speed-time graphs.



Complete the table below by writing the number of the speed-time graph that matches each distance-time graph.

distance-time graph	speed-time graph
<b>A</b>	.....
<b>B</b>	.....

(Total for Question 15 is 2 marks)





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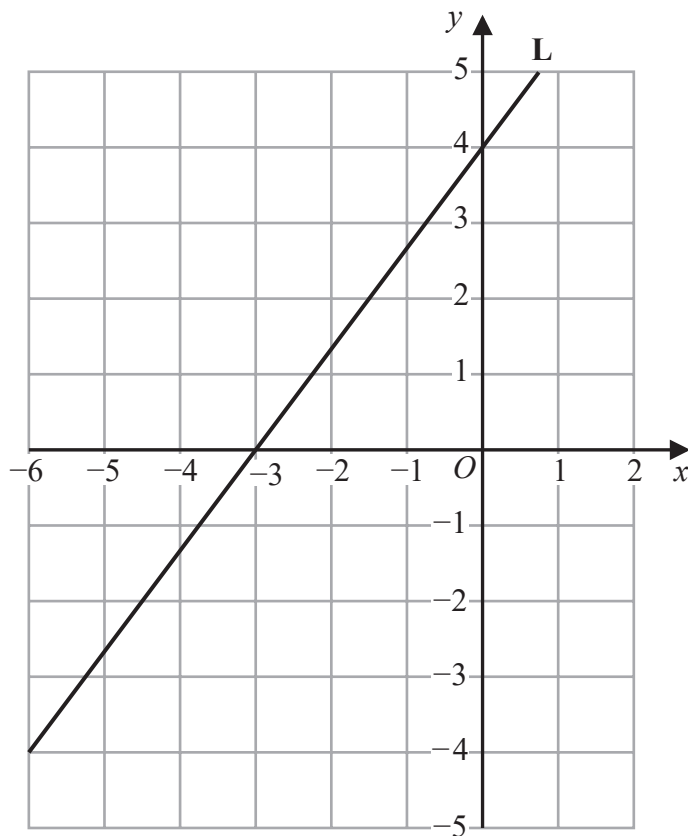
16 Solve  $\frac{2c - 3}{5} = 4$

$c = \dots\dots\dots$

**(Total for Question 16 is 3 marks)**



17 Here is a straight line **L** drawn on a grid.



Find an equation for **L**

.....  
(Total for Question 17 is 3 marks)

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**TOTAL FOR PAPER IS 80 MARKS**

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