**Pearson
Edexcel Award**

Algebra
**Level 2
Calculator NOT allowed**

Thursday 11 January 2018 – Morning
Time: 1 hour 30 minutes

Paper Reference
AAL20/01

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 ▶

P 5 6 4 7 3 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 $2b + 3d + 7b - 2d$

....

(2)

(b) (i) Simplify $(5x^2)^3$

....

(ii) Simplify $y^4 \times y^5$

....

(iii) Simplify $\dfrac{a^6}{a^2}$

....

(4)

(c) Expand $4(3a + c)$

....

(1)

(Total for Question 1 is 7 marks)

2 Jack buys n metres of ribbon.
The ribbon costs £3 per metre.

(a) Write down an expression in terms of n for the cost, in pounds, of n metres of ribbon.

....
(1)

Sarah orders 5 pairs of trousers costing £t each and 6 jumpers costing £j each.
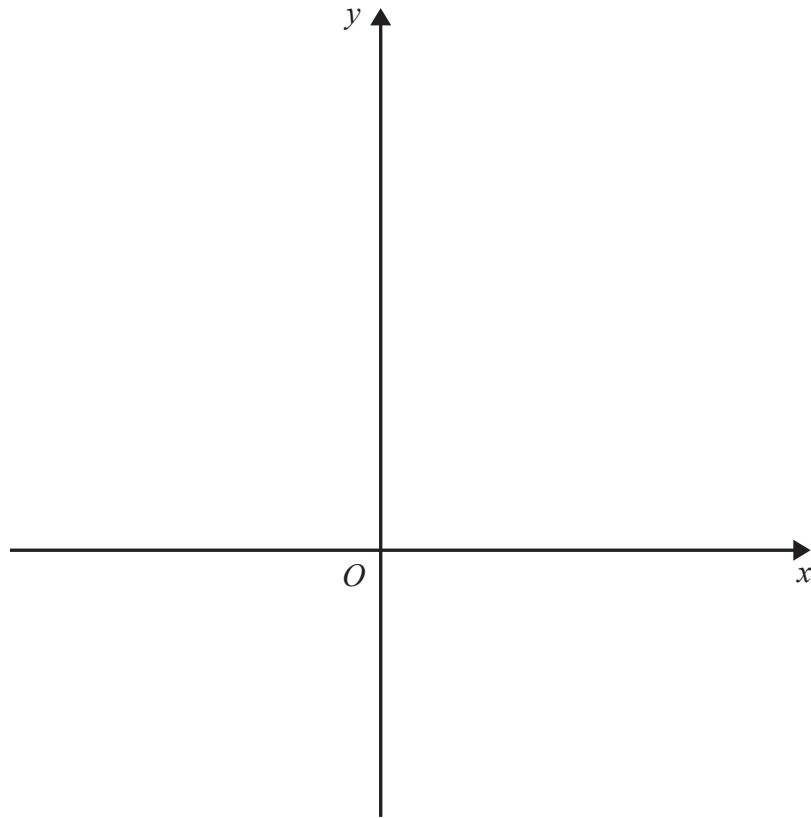The total cost of the order is £108

(b) Write down an equation in t and j for the total cost of the order.

....
(3)

(Total for Question 2 is 4 marks)

3 Sketch the graph of $y = 3x^2 + 5$

(Total for Question 3 is 3 marks)

4 On the grid, draw the graph of $y = 5 - 2x$ for values of x from -2 to 5
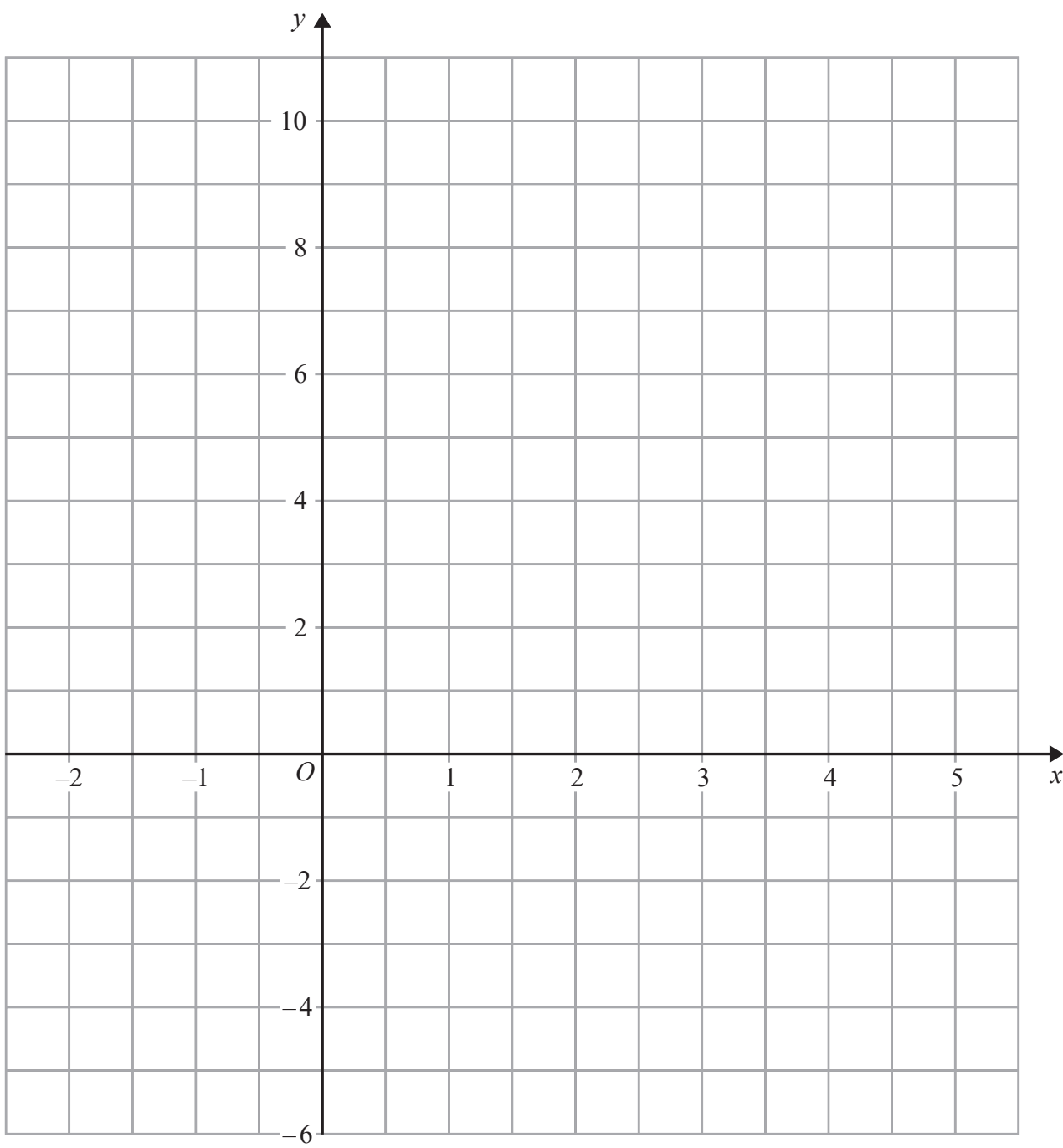
(Total for Question 4 is 3 marks)

5 (a) Factorise $7xy + xw$

....

(b) Factorise $3ab + 12ac$

....

(c) Factorise $4x^2 - 8x$

....

(Total for Question 5 is 5 marks)

6 The first term of a sequence is 12
  Other terms of the sequence are found by using the rule

"double the previous term and subtract 3"

(a) Work out the second term and the third term of this sequence.

....

(3)

Here are the first three terms of an arithmetic sequence.

7   4   1

(b) Find an expression, in terms of *n*, for the *n*th term of this sequence.

....

(2)

The *n*th term of a different arithmetic sequence is given by the expression $2n + 5$

(c) (i) Find the 15th term of the sequence.

....

   (ii) Is 87 a term of this sequence?
         Give a reason for your answer.

....

....

....

(4)

(Total for Question 6 is 9 marks)

7 Here is a formula $t = 2u - 3p$

(a) (i) Find the value of t when $u = 5$ and $p = 2$

....

(ii) Find the value of t when $u = -7$ and $p = -5$

....

(iii) Find the value of p when $t = 24$ and $u = 3$

....

(6)

(b) Make u the subject of the formula $t = 2u - 3p$

....

(2)

(Total for Question 7 is 8 marks)

8 (a) Solve $3f + 2 = 11$

$f = $ ....
(2)

(b) Solve $3n - 2 = 8 + n$

$n = $ ....
(3)

(c) Solve $\dfrac{4d + 3}{4} = 5$

$d = $ ....
(3)

(Total for Question 8 is 8 marks)

9 (a) Solve the inequality $x - 3 > 0$

....
(1)

(b) Solve the inequality $-3y + 2 > 8$

....
(3)

(Total for Question 9 is 4 marks)

10 (a) Here is an inequality in x shown on a number line.

$$\bullet\!\!-\!\!-\!\!-\!\!-\!\!\circ$$

$$-5 \quad -4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad x$$
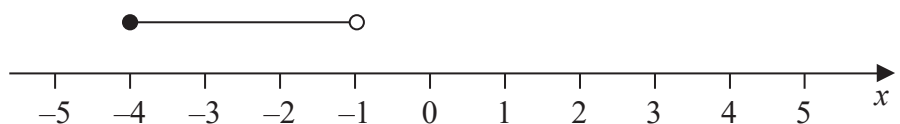
Write down the inequality.

....

(2)

(b) On the number line below, show the inequality $y \geqslant -2$

$$-5 \quad -4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad y$$
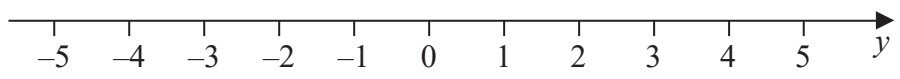
(2)

$3 \leqslant n < 12$

n is an integer.

(c) (i) Write down the least possible value of n.

....

(ii) Write down the greatest possible value of n.

....

(2)

(Total for Question 10 is 6 marks)

11 The straight line **L** is drawn on the grid below.
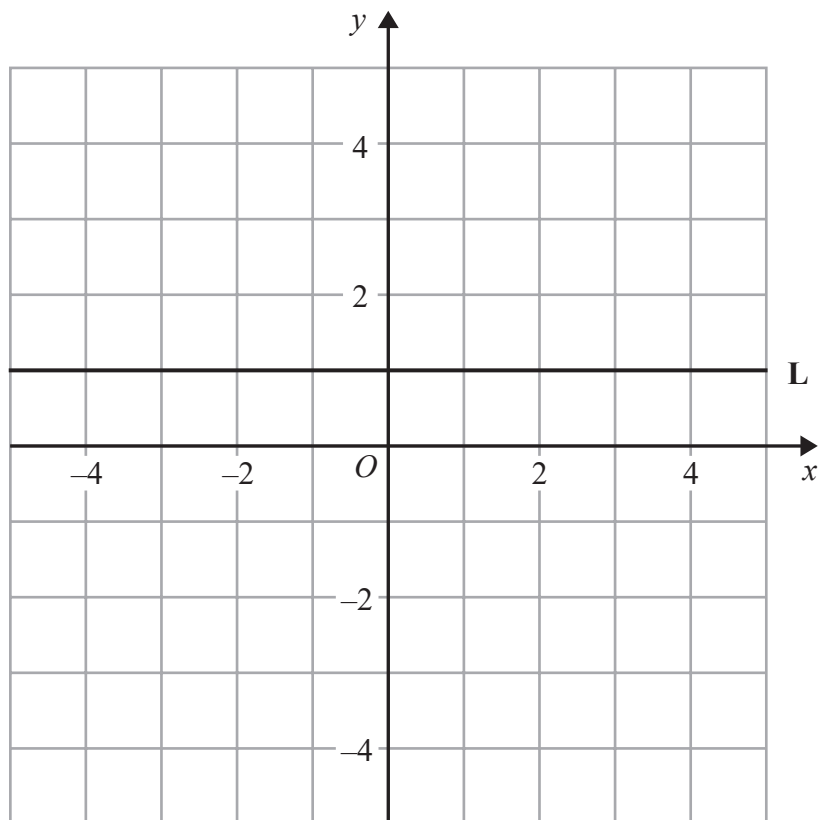
(a) Write down an equation of the line **L**.

....

(1)

Here is the straight line **M** drawn on a grid.
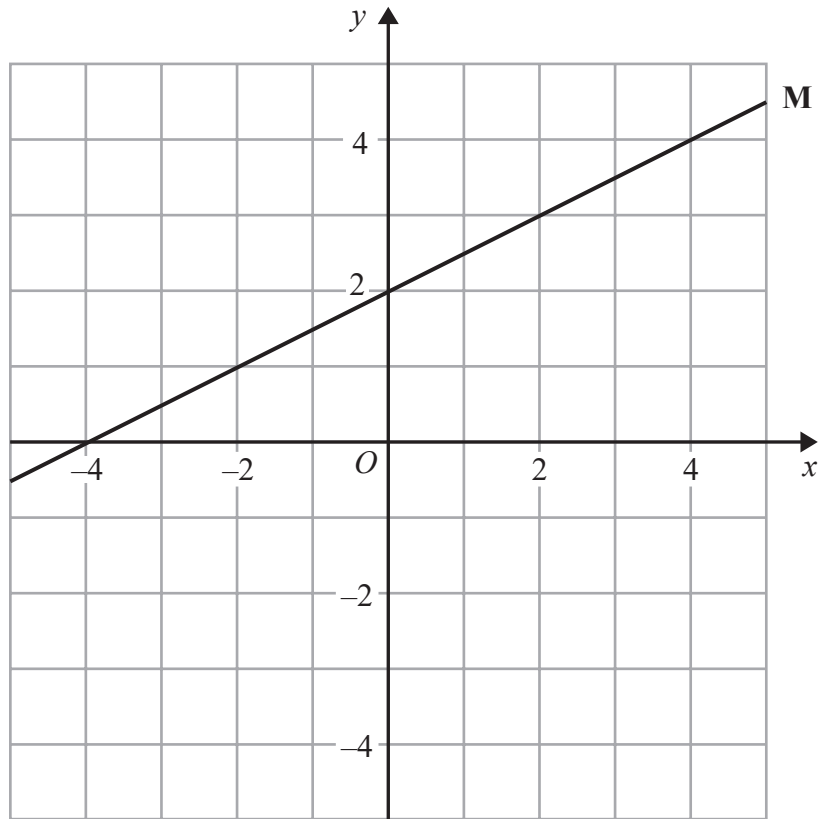
(b) (i) Find the gradient of **M**.

....

(ii) Find an equation of **M**.

....

(4)

(Total for Question 11 is 5 marks)

12 Pablo left his home at 10 00 and cycled to Coulton's house.
On his way to Coulton's house, Pablo stopped for a rest.
He then continued his journey to Coulton's house.

The distance-time graph for Pablo's journey to Coulton's house is shown on the grid.
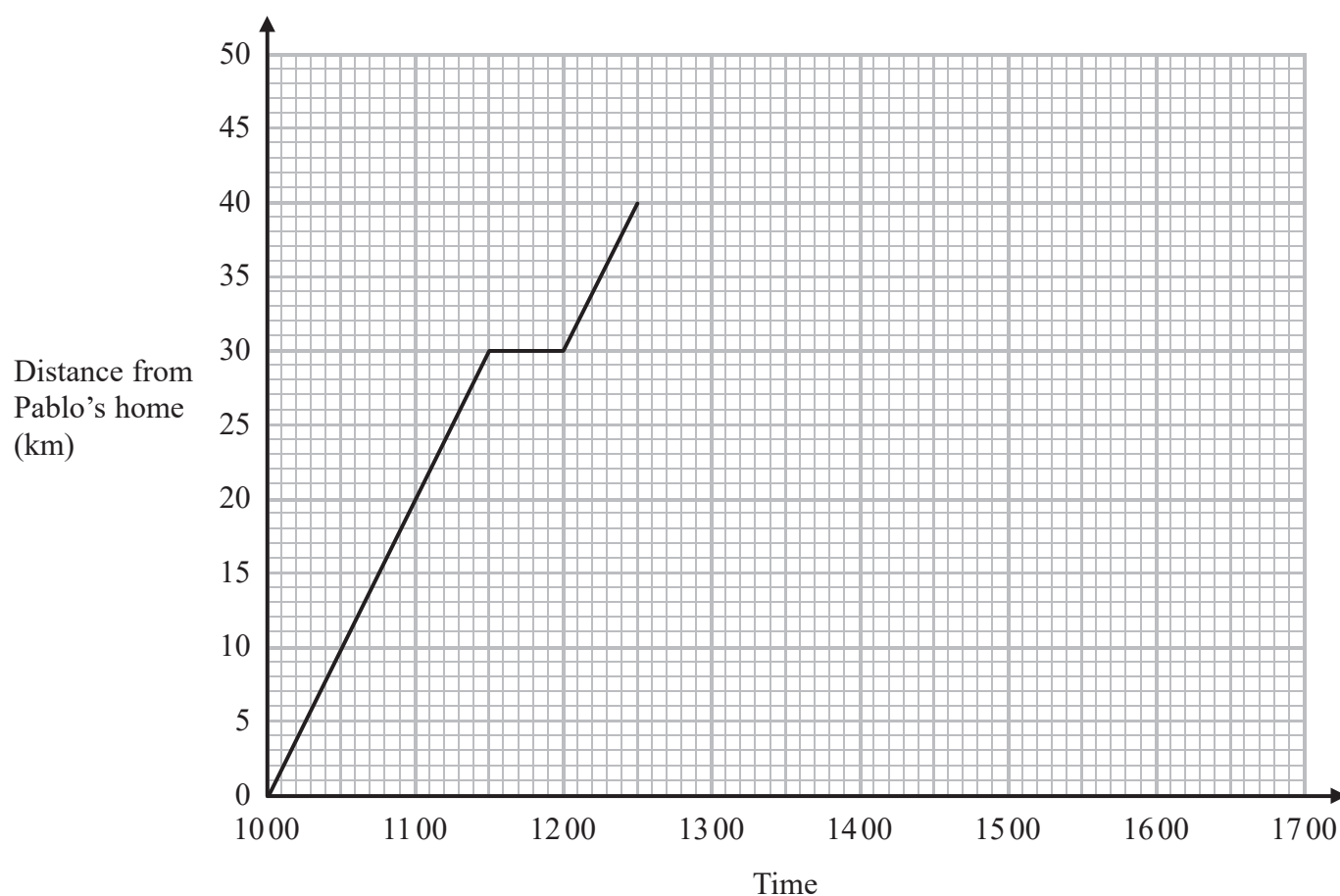
(a) (i) Work out the gradient of the graph between 10 00 and 11 30

....

(ii) What does the gradient of this line represent?

....

(3)

(b) For how long was Pablo cycling on his journey from his home to Coulton's house?
Give your answer in minutes.

.... minutes

(2)

Pablo stayed at Coulton's house for 1 hour 45 minutes.
He then cycled home at a speed of 16 km/h.
He did not stop on his way home.

(c) On the grid, draw the distance-time graph for this information.

(3)

(d) Write down the times when Pablo was 15 km from his home.

....

....

(2)

(Total for Question 12 is 10 marks)

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

x	–2	–1	0	1	2	3	4
y	7			–2	–1		

(2)

(b) On the grid, draw the graph of $y = (x-1)^2 - 2$ for values of x from –2 to 4
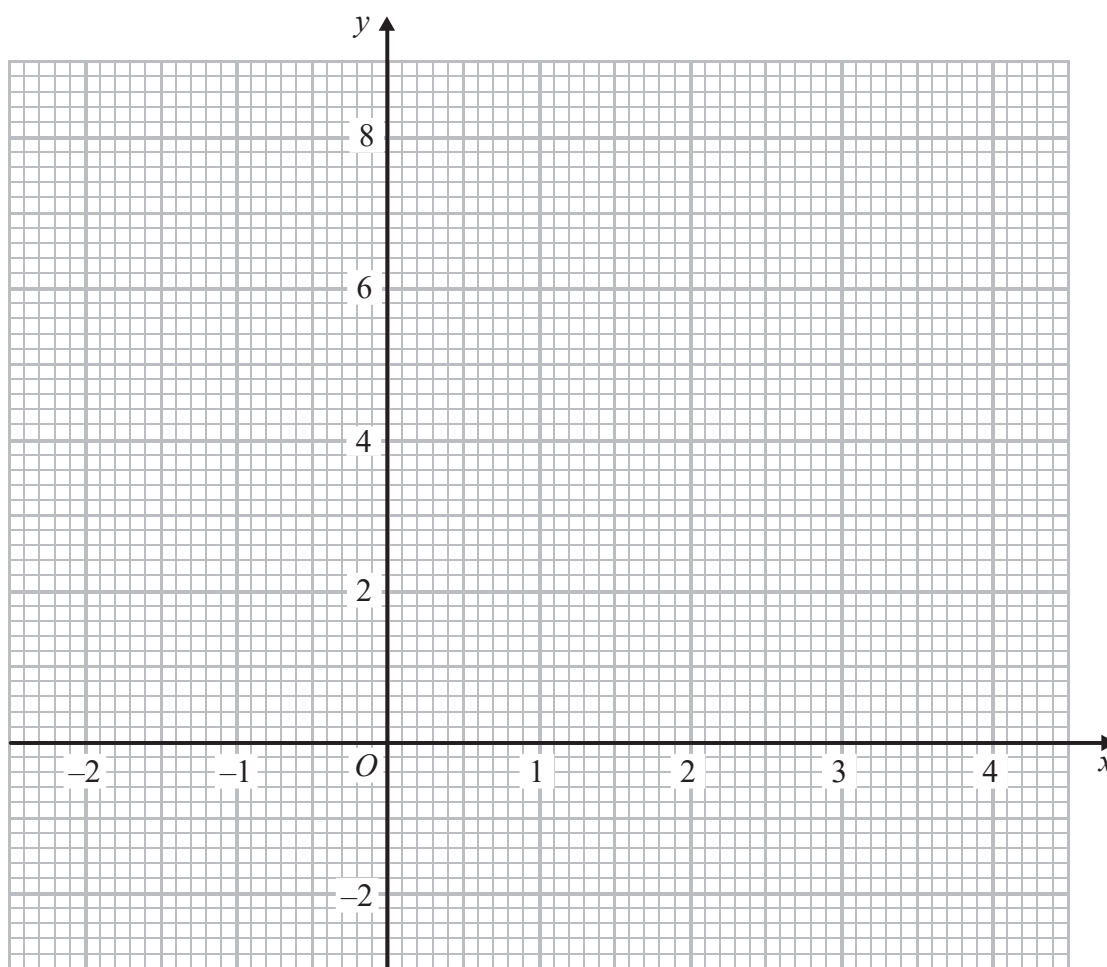
(2)

(c) Use your graph to find estimates for the solutions of $(x-1)^2 - 2 = 0$

....

(2)

(Total for Question 13 is 6 marks)

14 Here are four statements and four sketch graphs.
The graphs are labelled **A**, **B**, **C** and **D**.

Statement	Graph
Rob's car remained stationary in the car park 4 miles from home. *y* is the distance from home.	
The number of people, *y*, employed at a factory rose at a steady rate for a time and then remained constant.	
Sam drives her car at a constant speed on the journey from home. *y* is the distance from home.	
The value of the pound, *y*, rose at a steady rate and then fell for a time.	
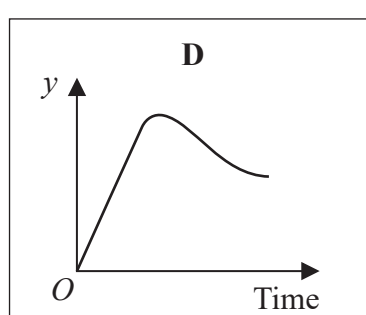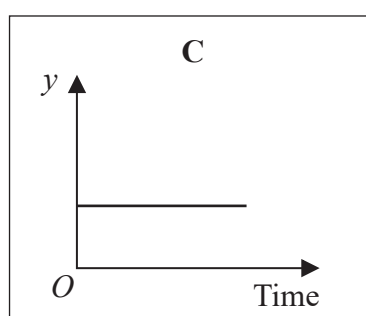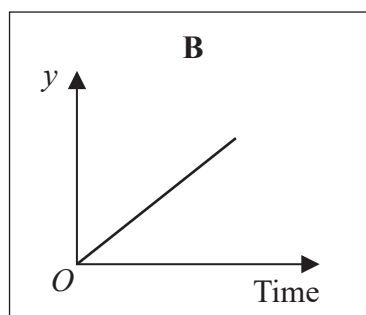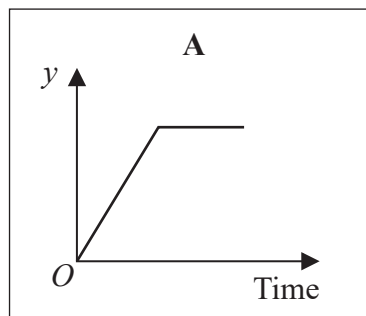
Write next to each statement the letter of the graph which best represents that statement.

A

B

C

D

(Total for Question 14 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

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P 5 6 4 7 3 A 0 2 0 2 0