Pearson
Edexcel Award

Centre Number

Candidate Number

Algebra
Level 2
Calculator NOT allowed

Tuesday 8 May 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

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 $2p \times 4p^2$

....
(1)

(b) Simplify $\dfrac{t^4}{t^3}$

....
(1)

(c) Simplify $(w^3)^2$

....
(1)

(d) Expand and simplify $3u(u + 2) + u(u - 4)$

....
(3)

(Total for Question 1 is 6 marks)

2 (a) Solve $\dfrac{3p}{2} = 12$

$p =$ ....
(2)

(b) Solve $2d - 9 = 13$

$d =$ ....
(2)

(c) Solve $4(x + 5) = 2x$

$x =$ ....
(3)

(Total for Question 2 is 7 marks)

3 The graph shows information about the cost of a taxi journey in Austria.
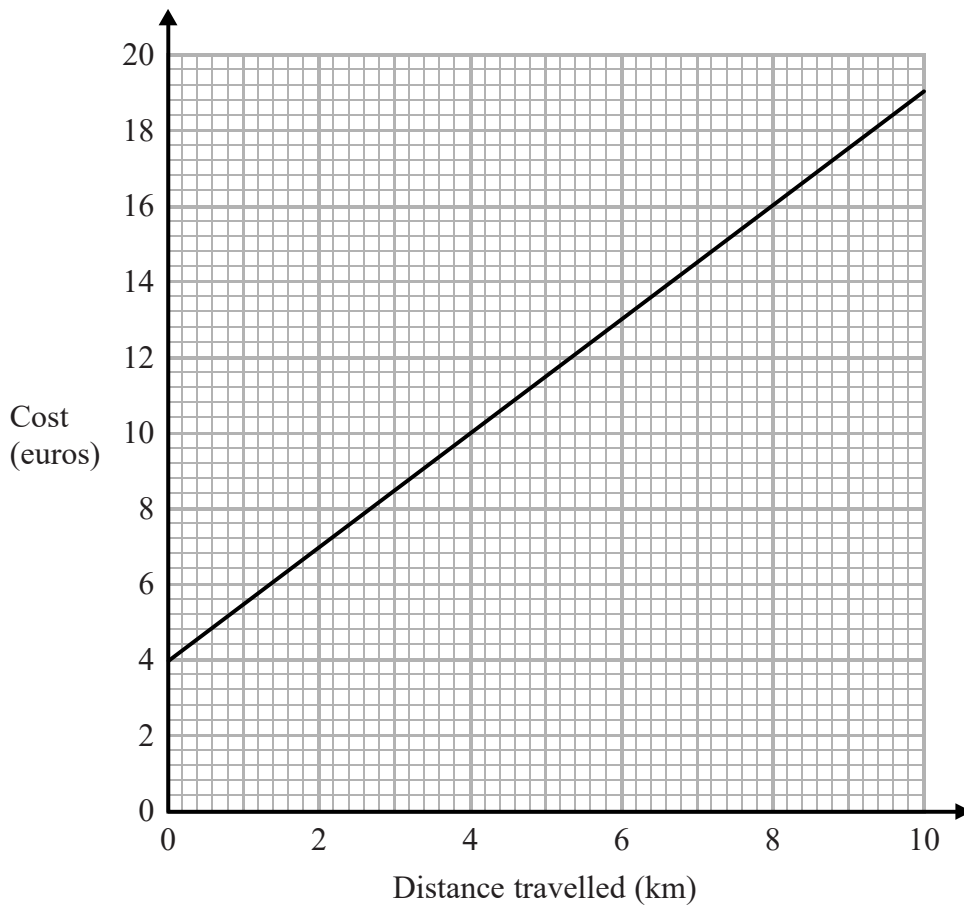
(a) Use the graph to find the cost of a 4 km taxi journey.

.... euros
(1)

Victoria used a taxi to take her from her hotel to the airport.
The cost of the taxi journey was 16 euros.

(b) Use the graph to find the distance the taxi travelled from the hotel to the airport.

.... km
(1)

(c) (i) Work out the gradient of the graph.

....

(ii) Explain what the gradient of the graph represents.

....

(3)

(Total for Question 3 is 5 marks)

4 Here are the first five terms of an arithmetic sequence.

<div align="center">15   19   23   27   31</div>

(a) (i) Work out the 8th term of this sequence.

....

(ii) Write down an expression, in terms of n, for the nth term of this sequence.

....

(3)

The first term of a different sequence is 32
Other terms of this sequence are found by using the rule

<div align="center">"divide the previous term by 2"</div>

(b) Write down the next three terms of this sequence.

.... , ... , ...

(2)

(Total for Question 4 is 5 marks)

5 (a) Simplify $p + 2u + 4p - 3u$

....

(b) Expand and simplify $t^2(t + t^3) + t^3$

....

(3)

(Total for Question 5 is 5 marks)

6 Place a tick in the table to show which one of the following is a formula.

	Formula
$x^2 + 2x = 4$	
$3ab + 4bc$	
$m = 5\sqrt{n + 2}$	

(Total for Question 6 is 1 mark)

7 (a) Complete the table of values for $y = -\frac{1}{2}x + 1$

x	-8	-4	0	4	8
y		3			

(2)

(b) On the grid, draw the graph of $y = -\frac{1}{2}x + 1$ for values of x from -8 to 8

(2)
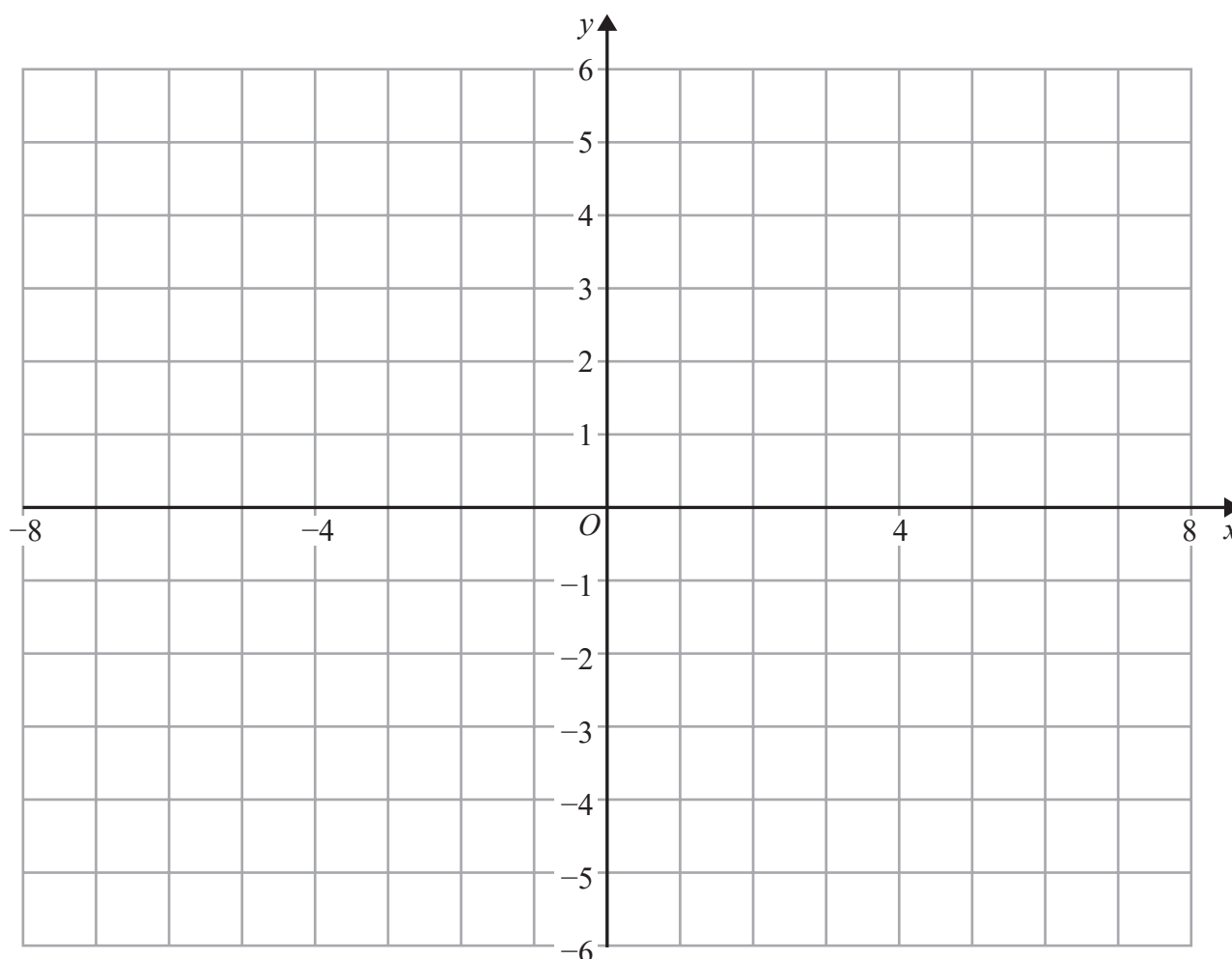
(Total for Question 7 is 4 marks)

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8 (a) Factorise $4 + 2t^2$

....
(1)

(b) Factorise $12u^2 - 18u$

....
(2)

(c) Factorise $5w^3x^2 - 10w^2x$

....
(2)

(Total for Question 8 is 5 marks)

9 $-2 \leqslant f < 5$

f is an integer.

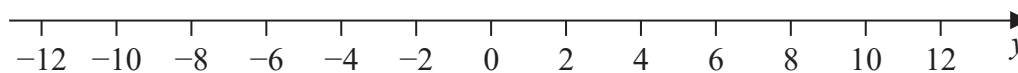(a) Write down all the possible values of f.

....

(1)

(b) Here is an inequality in x shown on a number line.
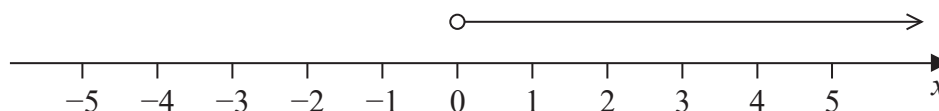
Write down the inequality.

....

(2)

(c) On the number line below, show the inequality $-10 < y \leqslant 4$

(2)

(d) Solve the inequality $6 + 2g > 12$

....

(2)

(Total for Question 9 is 7 marks)

10 Jon works *n* hours on each day that he works.
He is paid *e* pounds for each hour he works.

(a) Write down an expression, in terms of *e* and *n*, for Jon's daily earnings.

....

(1)

The number of hours Jon works each day decreases by 2 hours.
This week he works on 5 days.

(b) Write down an expression, in terms of *e* and *n*, for Jon's total pay in pounds this week.

....

(2)

(Total for Question 10 is 3 marks)

11 Sketch the graph of $y = 2x^2 - 8$
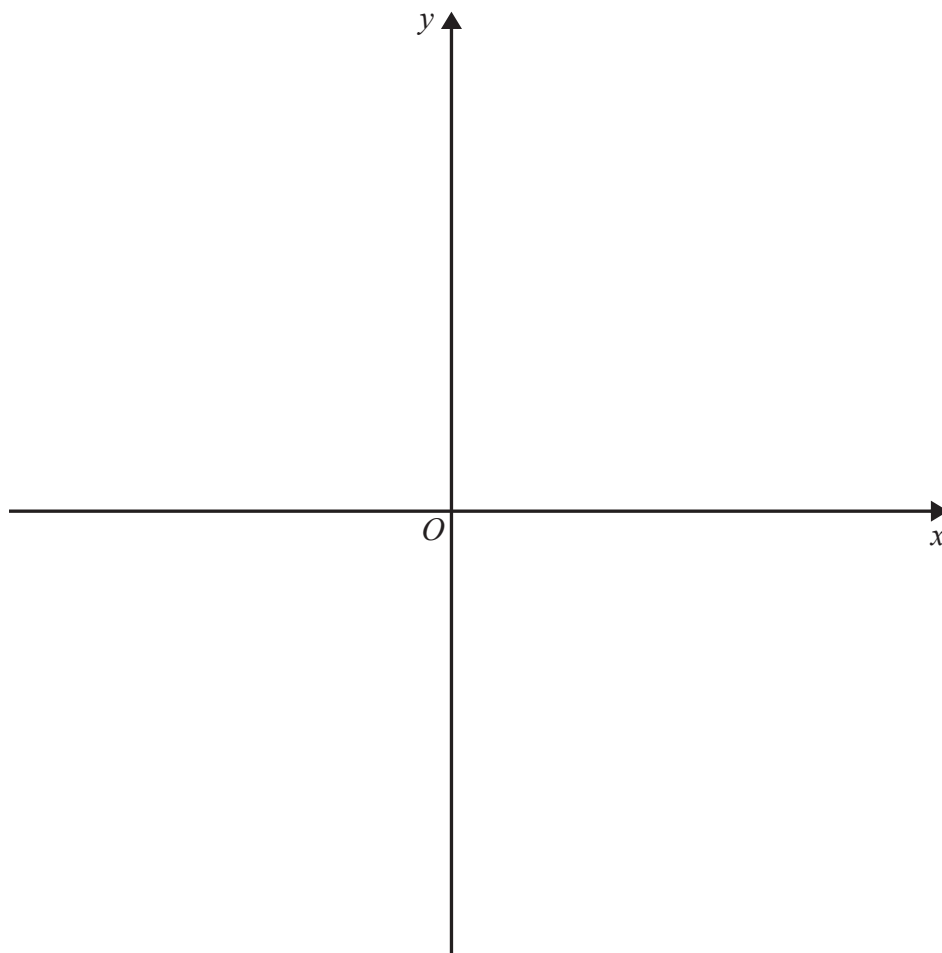
(Total for Question 11 is 3 marks)

12 (a) $m = 5(c - 1)$

   (i) Work out the value of m when $c = 10$

   ....

   (ii) Work out the value of m when $c = -4$

   ....

   (iii) Make c the subject of the formula.

   ....

   (5)

(b) $n = \sqrt{2q}$

   (i) Find the value of n when $q = 8$

   ....

   (ii) Find the value of q when $n = 9$

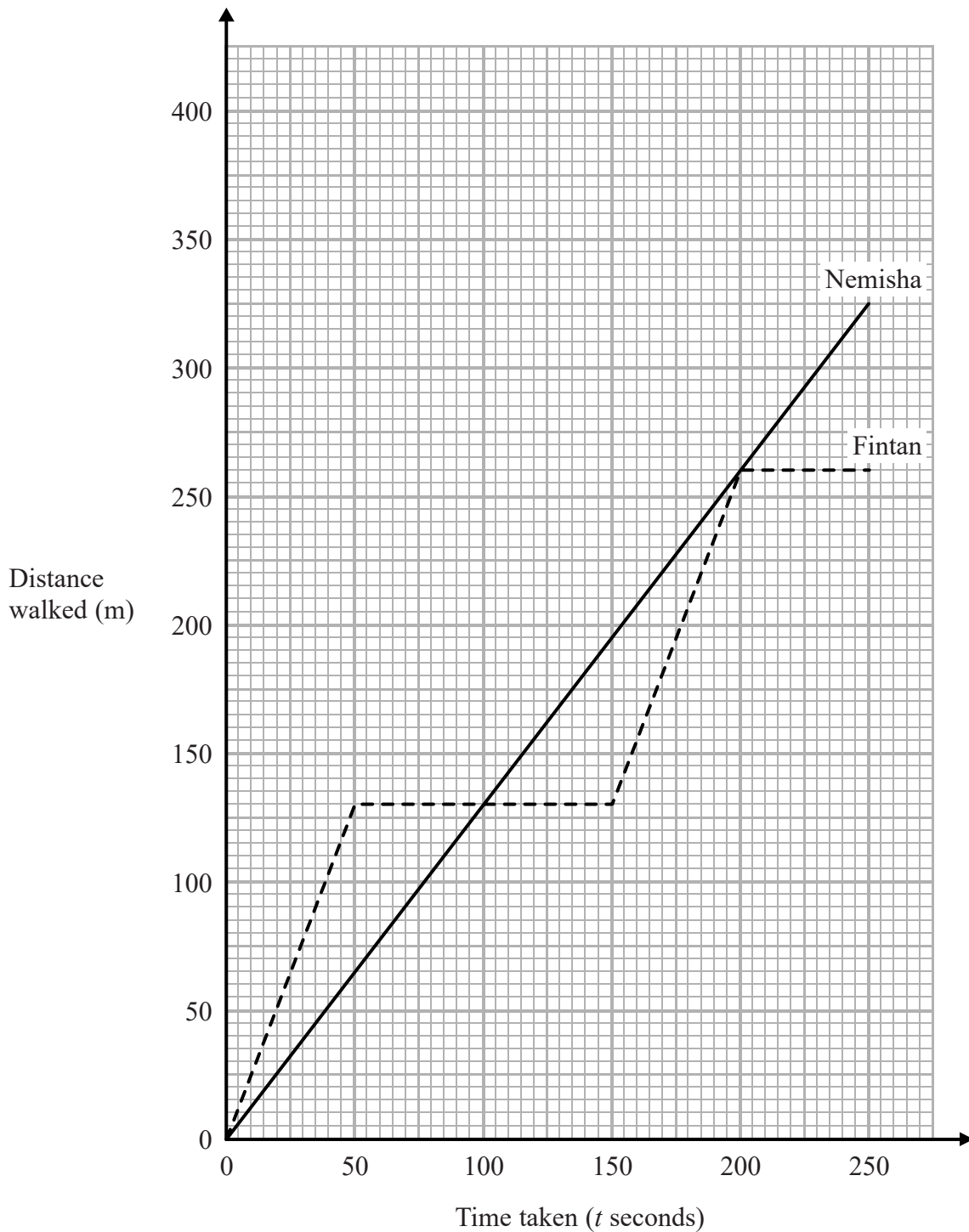   ....

   (4)

   (Total for Question 12 is 9 marks)

13 Fintan and Nemisha started walking at the same time.
They walked along the same route.

Here are the distance-time graphs for Fintan and Nemisha.

(a) Who had the greater speed between $t = 0$ and $t = 50$, Fintan or Nemisha?
Give a reason for your answer.

....

....

(1)

At time n seconds, Fintan had walked the same distance as Nemisha.

(b) Find two possible values for n.

....

(2)

(c) Work out Nemisha's speed.
   Give your answer in metres per second.

.... m/s

(2)

(d) On the grid below, draw a speed-time graph for Nemisha's walk for values of t from 0 to 250

Speed
(m/s)

0   50   100   150   200   250

Time taken (t seconds)

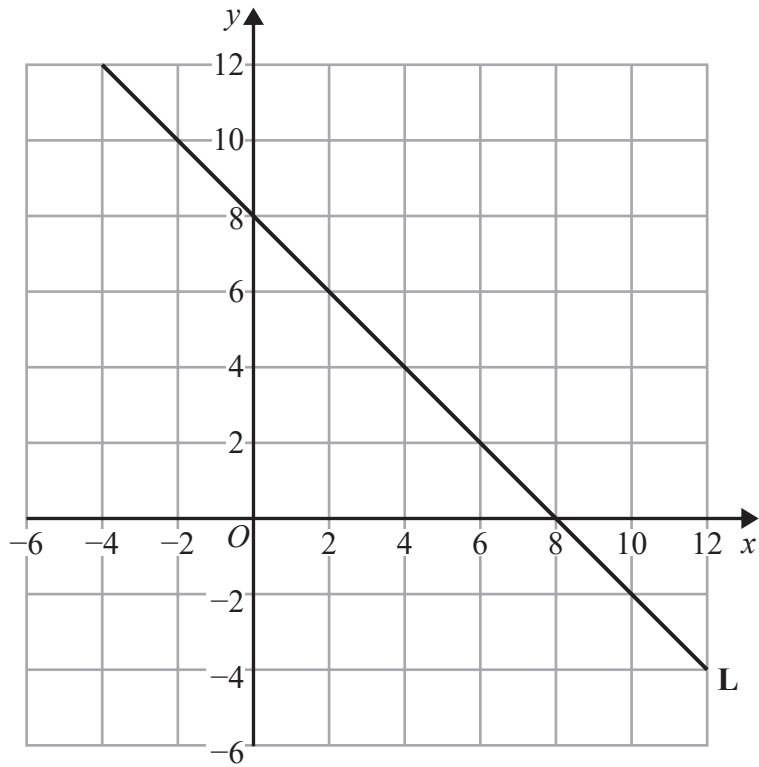**(2)**
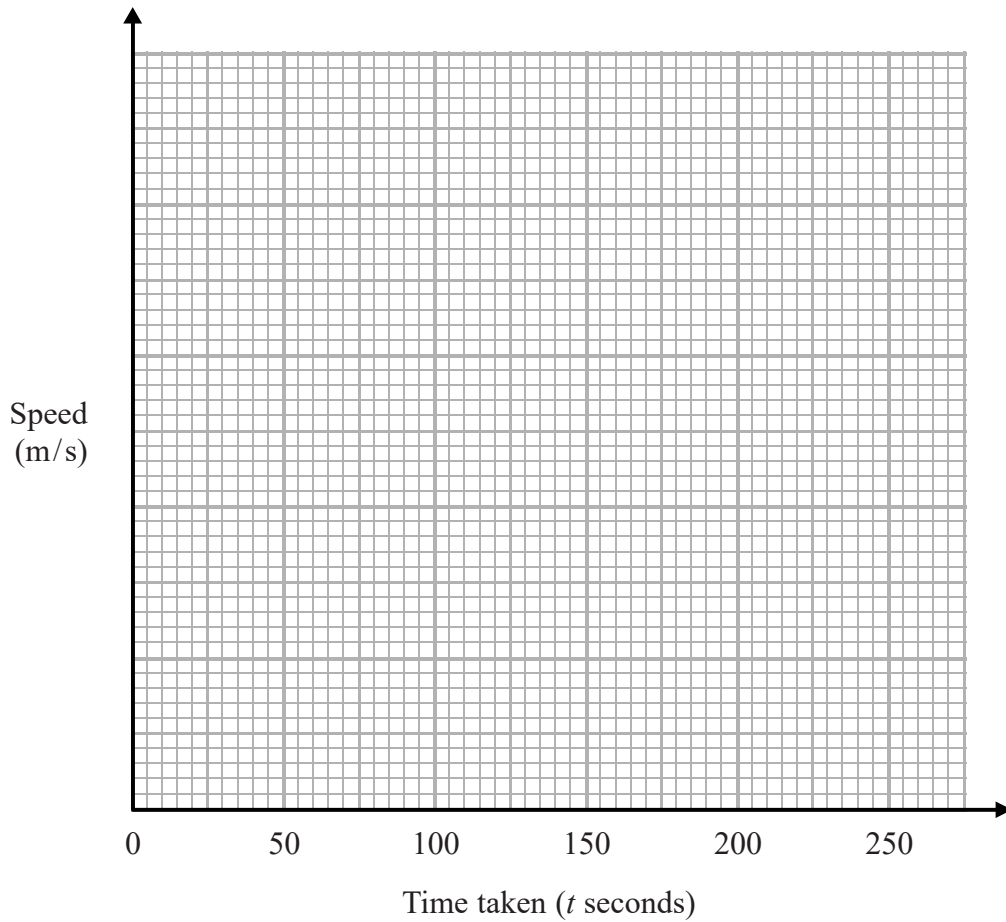
(Total for Question 13 is 7 marks)

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

Find an equation for **L**.

....

(Total for Question 14 is 2 marks)

15 (a) Solve $\dfrac{2x+1}{6} = \dfrac{1}{12}$

$x =$ ....
(2)

(b) Solve $3(2 - w) = 5(1 - w)$

$w =$ ....
(3)

(Total for Question 15 is 5 marks)

16 (a) Complete the table of values for $y = x^2 + 4x$

x	-6	-4	-2	0	2
y		0			

(2)

(b) On the grid, draw the graph of $y = x^2 + 4x$ for values of x from -6 to 2
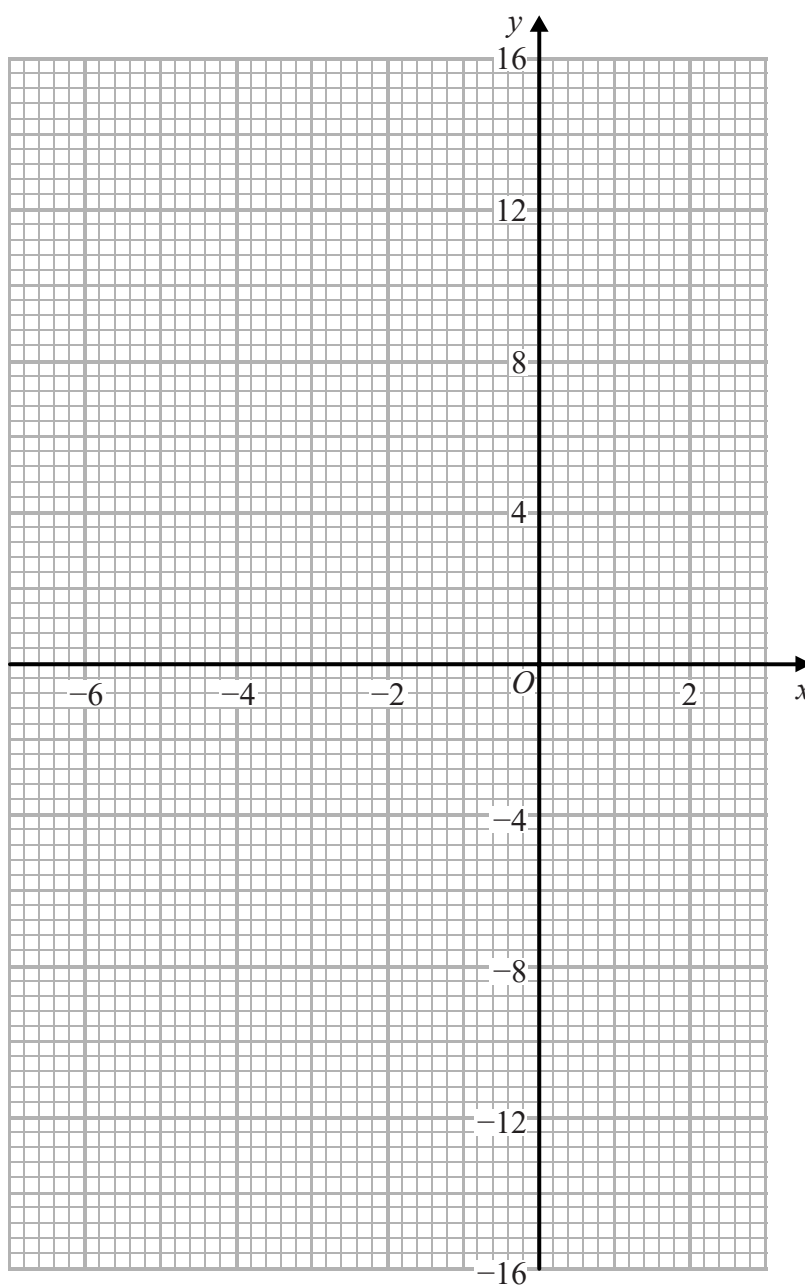
(2)

(c) Use your graph to find estimates for the solutions of $x^2 + 4x = 9$

....

(2)

(Total for Question 16 is 6 marks)

TOTAL FOR PAPER IS 80 MARKS

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