

# Pearson Edexcel Award

Paper Reference AAL20/01

## Algebra

Level 2

Calculator NOT allowed

Monday 8 May 2017 – Morning

Time: 1 hour 30 minutes

plus your additional time allowance

**You must have:**

Ruler graduated in centimetres and millimetres, pen,  
HB pencil, eraser.

See the **Instructions, Information and Advice** on the  
next page.

<b>Surname</b>					
<b>Other names</b>					
<b>Centre Number</b>					
<b>Candidate Number</b>					

X48374A

## Instructions

- Use **BLACK** ink or ball-point pen.
- **FILL IN THE BOXES** on the front 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.

**(There are four blank pages at the end of this exam paper in case more working out space is required.)**

**(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.**

**(Questions begin on next page.)**

1 (a) Simplify

$$5 \times m^2 \times 5 \times t^3$$

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(2 marks)

(Question continues on next page)

(Turn over)

(b) Simplify

$$g^5 \times g \times g$$

---

(1 mark)

(Question continues on next page)

(Turn over)

(c) Simplify

$$(p^4)^2$$

---

(1 mark)

(Question continues on next page)

(Turn over)

**(d) Simplify**

$$\frac{20r^2u}{2r}$$

---

**(2 marks)**

**(Total for Question 1 is 6 marks)**

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**(Turn over)**

2 (a) Solve

$$4p + 7 = 27$$

$p =$  \_\_\_\_\_

(2 marks)

(Question continues on next page)

(Turn over)

(b) Solve

$$2 \cdot 5t - 3 = 7$$

$t =$

---

(2 marks)

(Total for Question 2 is 4 marks)

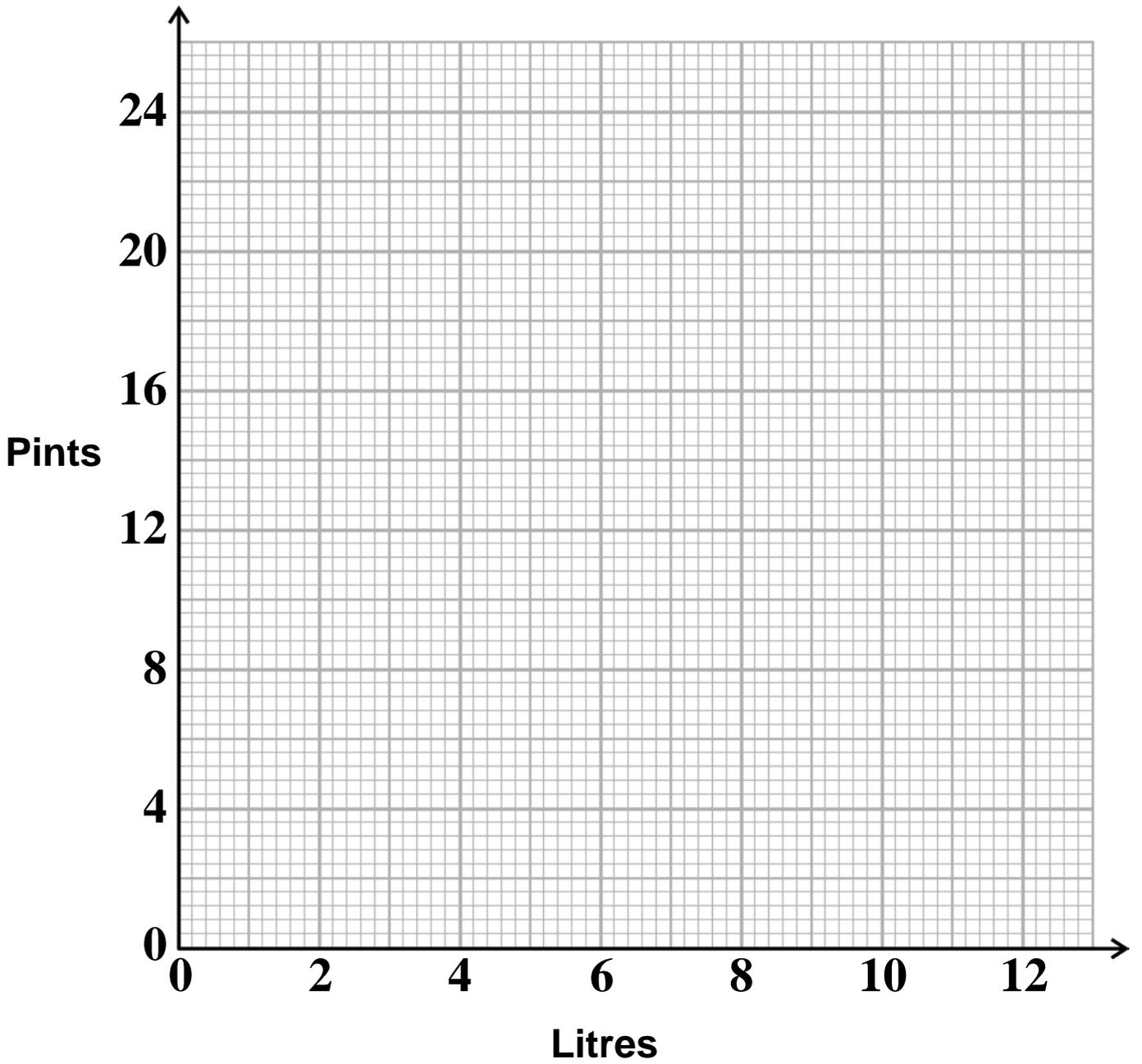
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(Turn over)

- 3 This table contains information that can be used to change between litres and pints.

<b>Litres</b>	<b>0</b>	<b>4</b>	<b>8</b>	<b>12</b>
<b>Pints</b>	<b>0</b>	<b>7</b>	<b>14</b>	<b>21</b>

- (a) On the grid (on the next page), use the information in the table to draw a graph that can be used to change between litres and pints.  
(2 marks)



**(b) Use your graph to change**

**(i) 9 litres into pints,**

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**pints**

**(ii) 12 pints into litres.**

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**litres**

**(2 marks)**

**(Question continues on next page)**

**(Turn over)**

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

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

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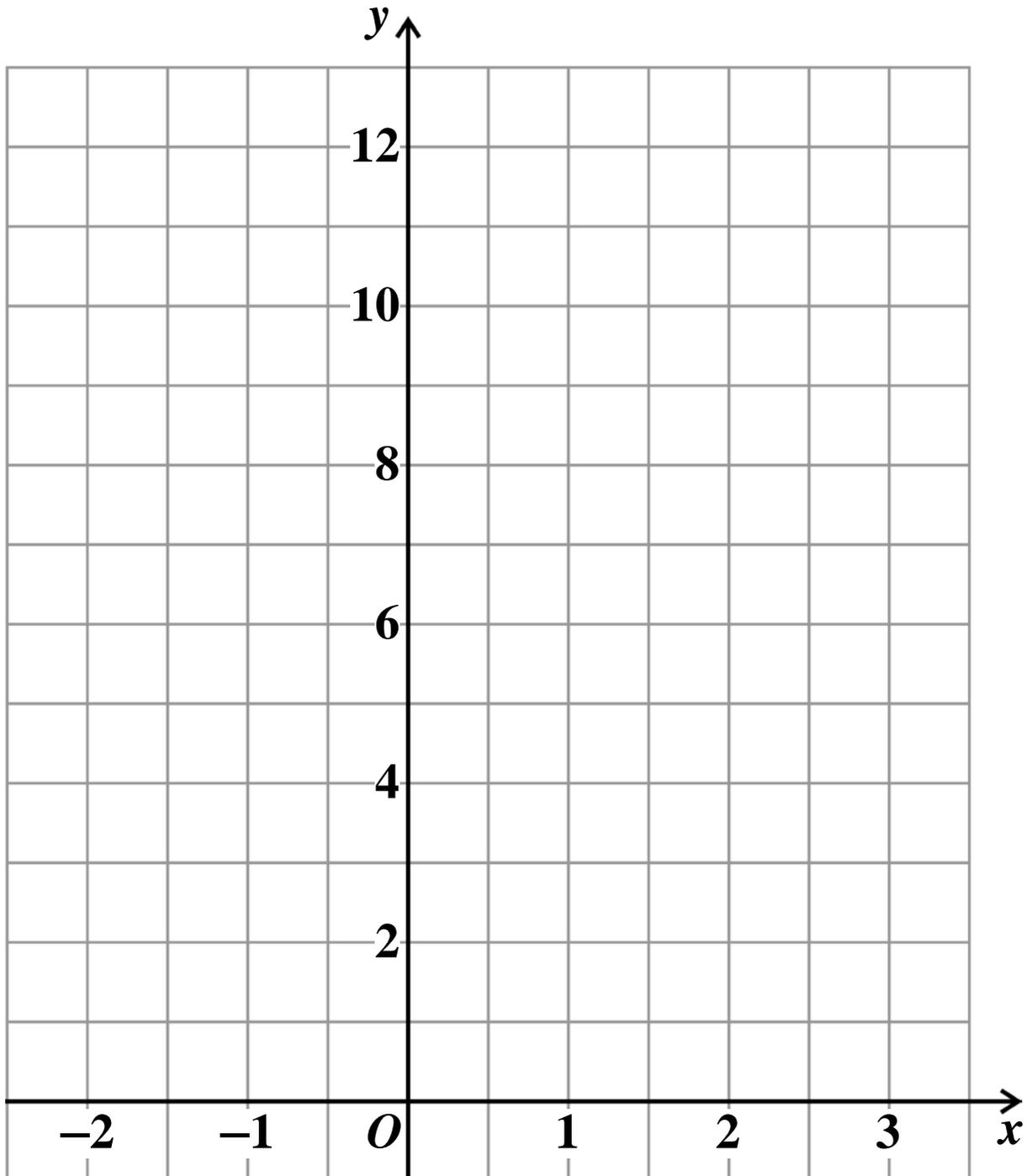
**(3 marks)**

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

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**(Turn over)**

- 4 On the grid, draw the graph of  $y = 8 - 2x$   
for values of  $x$  from  $x = -2$  to  $x = 3$



(Total for Question 4 is 3 marks)

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(Turn over)

5 (a) Expand

$$3m(m - 2)$$

---

(2 marks)

(Question continues on next page)

(Turn over)

(b) Expand

$$n^2 (n^4 - n^3)$$

---

(2 marks)

(Question continues on next page)

(Turn over)

**(c) Expand and simplify**

$$2(q + 7) + 3(q - 1)$$

---

**(2 marks)**

**(Total for Question 5 is 6 marks)**

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**(Turn over)**

6 (a) The first term of a sequence is 5

Other terms of the sequence are worked out using the rule

“multiply the previous term by 10  
and subtract 1”

Work out the third term of this sequence.

---

(2 marks)

(Question continues on next page)

(Turn over)

- (b) Here are the first six terms of an arithmetic sequence.

100 91 82 73 64 55

- (i) Write down the next term of this sequence.

- 
- (ii) Find an expression, in terms of  $n$ , for the  $n$ th term of this sequence.

---

(3 marks)

(Question continues on next page)

(Turn over)

- (c) The  $n$ th term of a different sequence is given by the expression  $8n^2$

Find the 5th term of this sequence.

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(2 marks)

(Total for Question 6 is 7 marks)

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(Turn over)

7 (a) Factorise

$$2m - 10$$

---

(1 mark)

(Question continues on next page)

(Turn over)

**(b) Factorise**

$$6n^2 + 3n$$

---

**(2 marks)**

**(Question continues on next page)**

**(Turn over)**

(c) Factorise

$$rt - r^2t$$

---

(2 marks)

(Total for Question 7 is 5 marks)

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(Turn over)

**8 Workers in a factory make two types of component.**

**Each type A component takes 5 minutes to make.**

**Each type B component takes 8 minutes to make.**

**Nick made  $x$  type A components  
and  $y$  type B components.**

- (a) Write down an expression, in terms of  $x$  and  $y$ ,  
for the total time in minutes it took Nick to make  
these components.**

**minutes**

---

**(2 marks)**

**(Question continues on next page)**

**(Turn over)**

Flinn made  $2x$  type A components and  $3y$  type B components.

Rob made  $4x$  type A components and  $2y$  type B components.

- (b) Write down an expression, in terms of  $x$  and  $y$ , for the total number of components that Flinn and Rob made.

Give your answer in its simplest form.

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components

(2 marks)

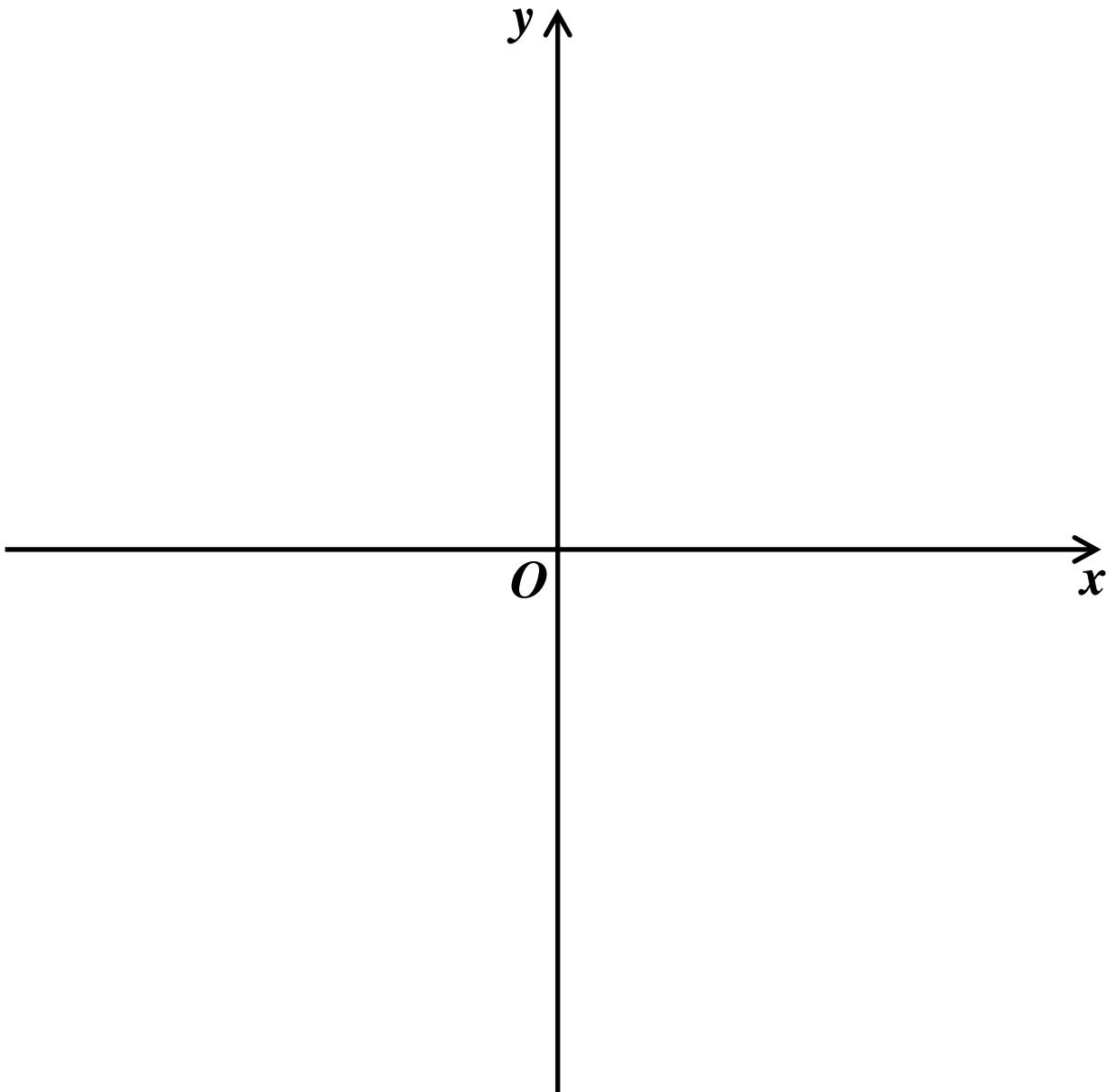
(Total for Question 8 is 4 marks)

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(Turn over)

9 Sketch the graph of

$$y = 2x^2 - 5$$



(Total for Question 9 is 3 marks)

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(Turn over)

10 (a)  $m = 2s - 3t$

- (i) Work out the value of  
 $m$  when  $s = 6$  and  $t = 5$

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(Question continues on next page)

(Turn over)

- (ii) Work out the value of  
 $s$  when  $m = 20$  and  $t = -4$

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(Question continues on next page)

(Turn over)

(iii) Make  $t$  the subject of the formula

$$m = 2s - 3t$$

---

(6 marks)

(Question continues on next page)

(Turn over)

$$(b) \quad p = \frac{d^2}{4}$$

(i) Find the value of  $p$  when  $d = 10$

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(Question continues on next page)

(Turn over)

(ii) Find a value of  $d$  so that  $p = 16$

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(3 marks)

(Total for Question 10 is 9 marks)

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(Turn over)

11  $-4 < w \leq 4$

$w$  is an integer.

(a) Write down one possible negative value of  $w$ .

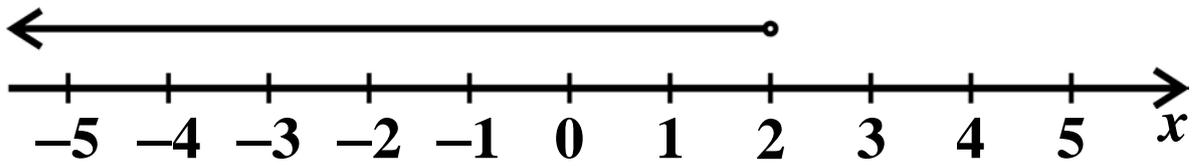
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(1 mark)

(Question continues on next page)

(Turn over)

(b) Here is an inequality shown on a number line.



Write down this inequality.

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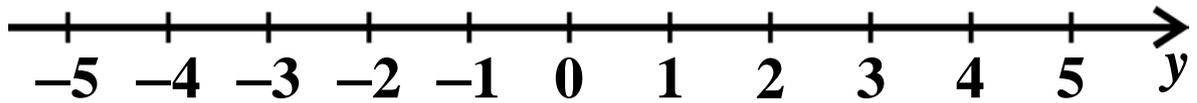
(2 marks)

(Question continues on next page)

(Turn over)

(c) On the number line below, show the inequality

$$-3 \leq y \leq 0$$



(2 marks)

(Question continues on next page)

(Turn over)

(d) Solve the inequality

$$4d + 9 > 5$$

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(2 marks)

(Total for Question 11 is 7 marks)

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(Turn over)

**12 Abby walked 3 km from her home to her friend's house.**

**Abby left home at 10 00**

**On the next page is part of the travel graph for Abby's journey from her home to her friend's house.**

**At 10 15 Abby stopped for 5 minutes to go into a shop.**

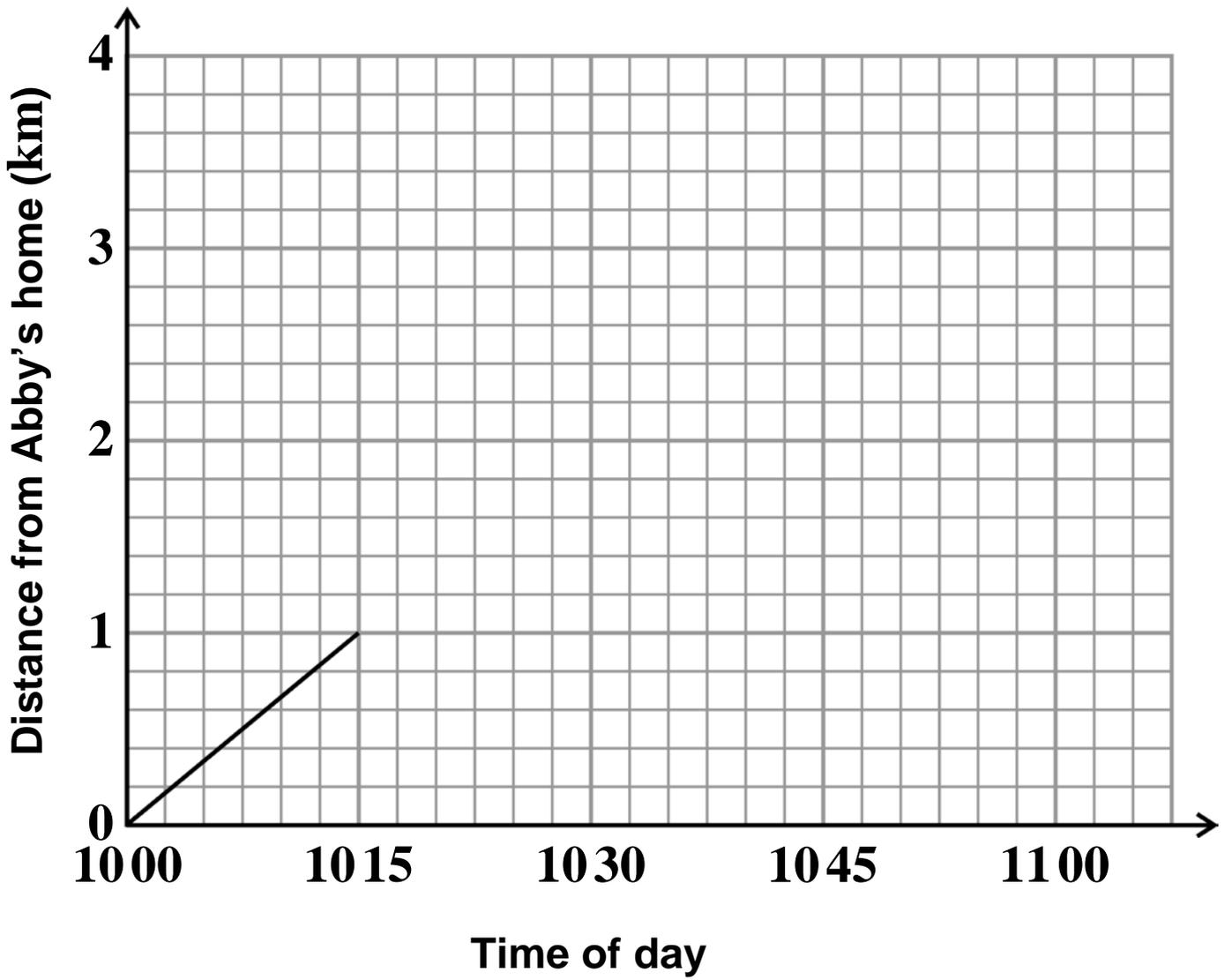
**Abby then walked at a steady speed to her friend's house.**

**She arrived at her friend's house at 11 00**

**(a) Use this information to complete the travel graph (on the next page) for Abby's journey to her friend's house. (2 marks)**

**(Question continues on page 38)**

**(Turn over)**



(Question continues on next page)

(Turn over)

- (b) Work out Abby's speed for the first 15 minutes of her journey.

Give your answer in **km/h**.

**km/h**

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**(2 marks)**

**(Total for Question 12 is 4 marks)**

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**(Turn over)**

13 (a) Solve

$$\frac{x + 4}{2} = 5$$

$x =$

---

(2 marks)

(Question continues on next page)

(Turn over)

**(b) Solve**

$$2(y - 3) = 4y$$

$y =$

---

**(3 marks)**

**(Total for Question 13 is 5 marks)**

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**(Turn over)**

14 (a) Complete the table of values for

$$y = x^2 - 6x + 10$$

$x$	-2	0	2	4	6	8
$y$			2			26

(2 marks)

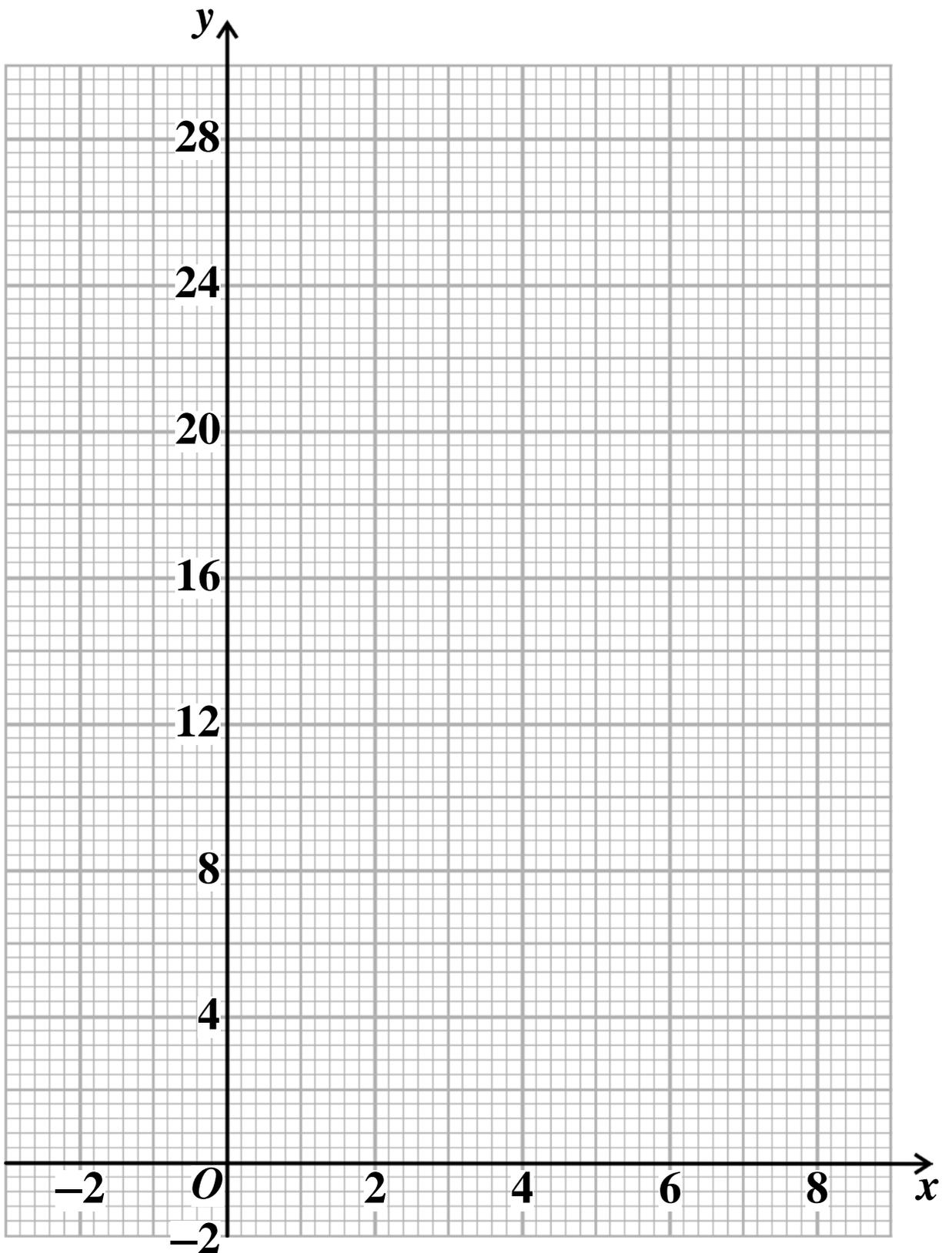
(b) On the grid, on the next page, draw the graph of

$$y = x^2 - 6x + 10$$

for values of  $x$  from -2 to 8

(2 marks)

(Turn over)



(Question continues on next page)

(Turn over)

- (c) Use your graph to find estimates for the solutions of

$$x^2 - 6x + 10 = 14$$

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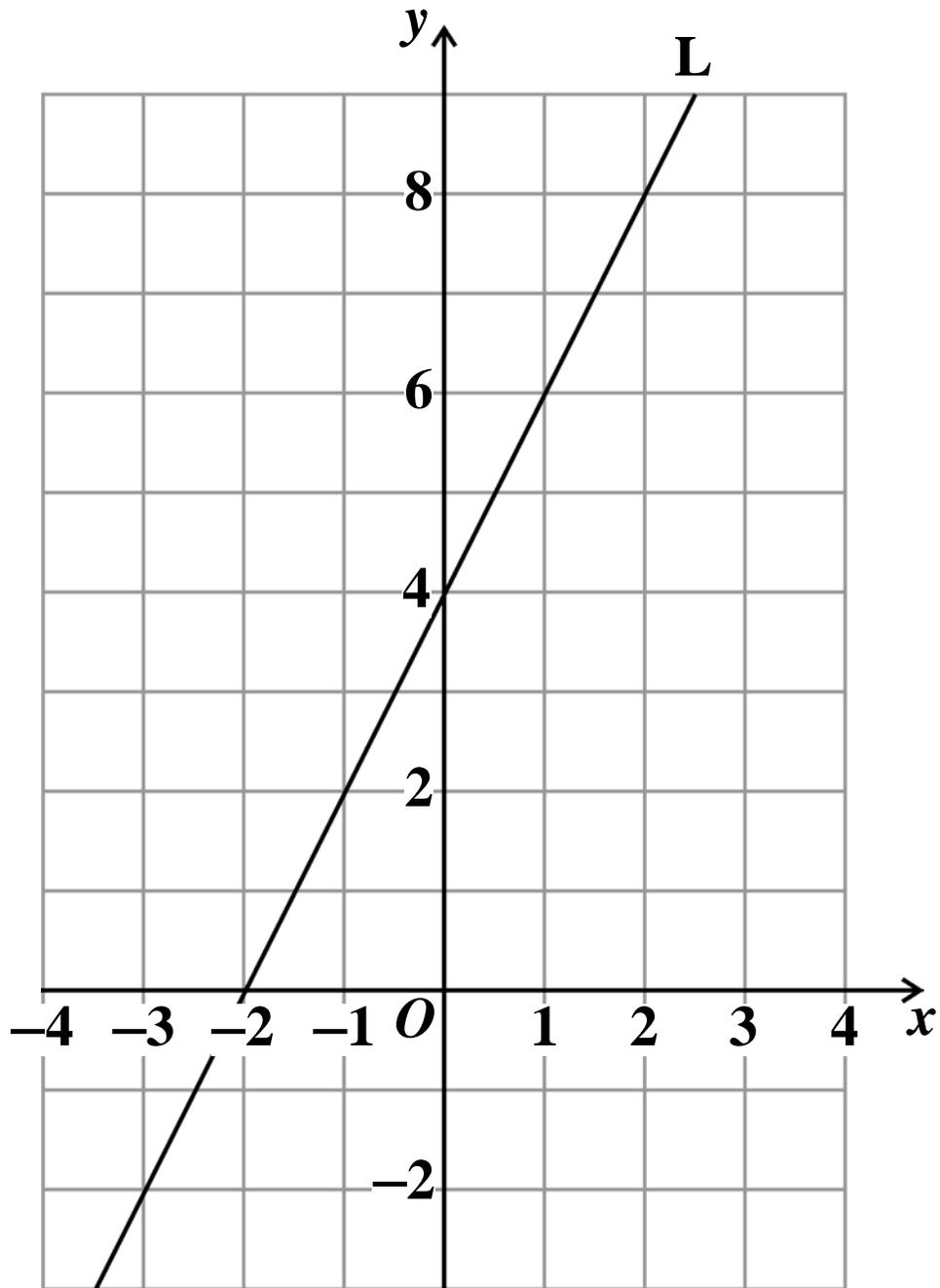
(2 marks)

(Total for Question 14 is 6 marks)

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(Turn over)

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



(Continues on next page)

(Turn over)

(i) Find the gradient of  $L$ .

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(Question continues on next page)

(Turn over)

(ii) Find an equation for  $L$ .

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(Total for Question 15 is 4 marks)

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**TOTAL FOR PAPER IS 80 MARKS**







