Write your name here

Surname	Other names

Pearson Edexcel Award

Centre Number	Candidate Number

Algebra

Level 2
Calculator NOT allowed

Thursday 15 January 2015 – 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 ▶

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P 4 5 8 7 3 A 0 1 1 6

PEARSON

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1 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**
$3x + 4$			
$19 = 3x + 4$			
Area = width × height ÷ 2			

(Total for Question 1 is 2 marks)

2 (a) Simplify $x + 5y + 7 + 4x - 2y + 6$

.....

(2)

(b) Expand $5(3x - 4)$

.....

(2)

(c) Simplify $(a^2)^5$

.....

(1)

(d) Simplify $b^2 \times b^6$

.....

(1)

(Total for Question 2 is 6 marks)

3 For a music concert, an adult ticket costs £a and a child ticket costs £c.

Rita buys 4 adult tickets and 6 child tickets for the concert.

(a) Write down an expression for the total cost, in pounds, of Rita's tickets.

.....

(2)

Bert buys 8 adult tickets for the concert.

The total cost of Bert's tickets is £T.

(b) Write down a formula for T in terms of a.

.....

(2)

(Total for Question 3 is 4 marks)

4 Here is a formula $k = rt + 4$

(a) Find the value of k when $r = 3$ and $t = 6$

.....

(2)

(b) Find the value of r when $t = 10$ and $k = 54$

.....

(3)

(c) Make t the subject of the formula $k = rt + 4$

$t =$ .....

(2)

(Total for Question 4 is 7 marks)

5 (a) Solve $3x + 14 = 4 - 2x$

$x =$ .....

(2)

(b) Solve $7y - 5 = 3(y + 11)$

$y =$ .....

(3)

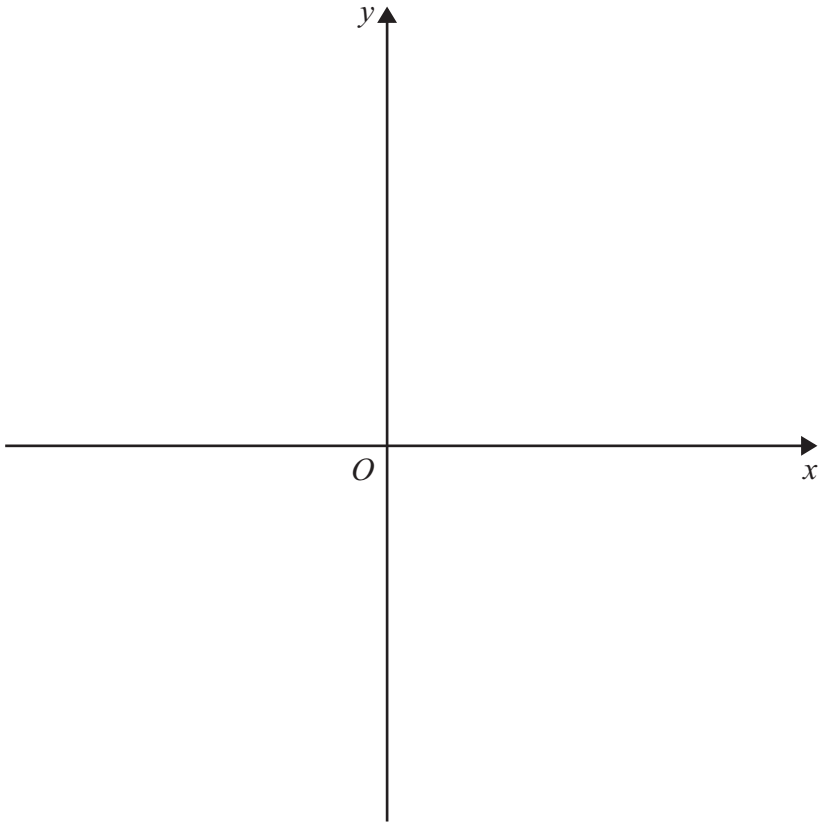
(c) Solve $\frac{w}{4} + 5 = 8$

$w =$ .....

(2)

(Total for Question 5 is 7 marks)

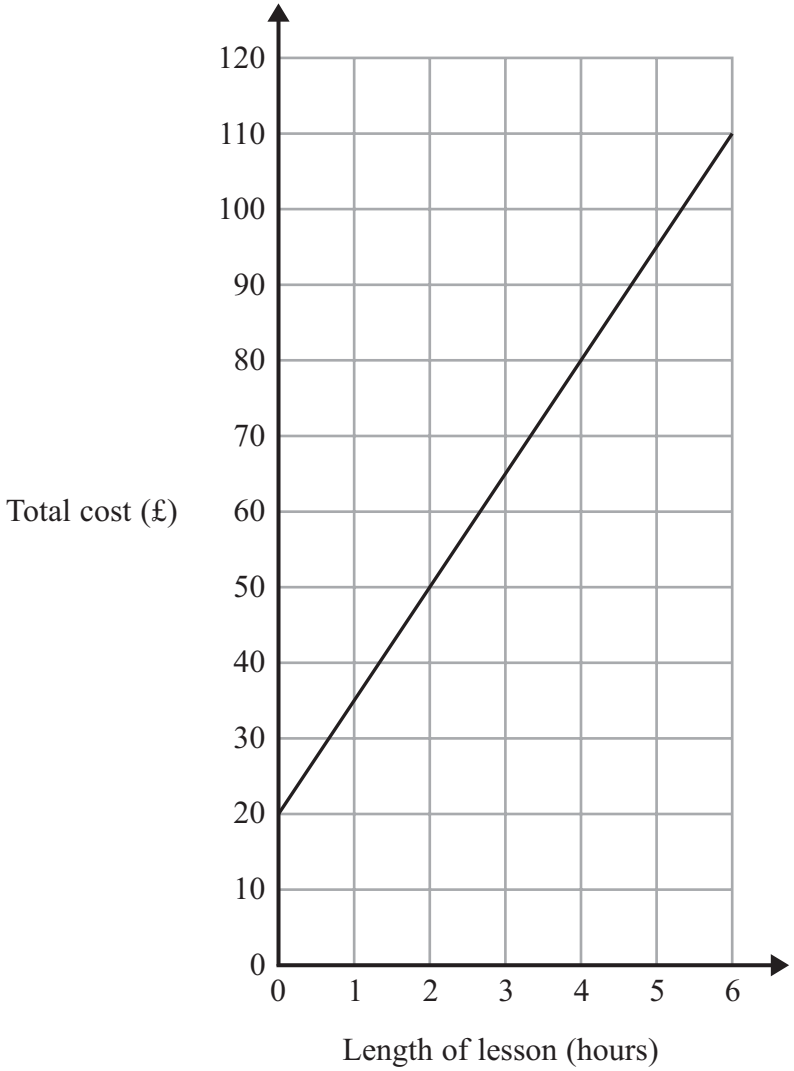
6 Sketch the graph of $y = 10 - x^2$



(Total for Question 6 is 3 marks)

7 The members of a surf club give surfing lessons.
They charge £20 to hire the equipment needed for a lesson.
They also charge a fixed rate for each hour a lesson lasts.

This information is shown on the graph below.



Essa hires equipment for a lesson.
She has a lesson that lasts 3 hours.

(a) Write down the total cost of Essa's lesson.

£ .....

(1)

(b) Use the graph to find the fixed rate charged for each hour a lesson lasts.

£ .....

(2)

Brian has £60 to spend on a surfing lesson.
He needs to hire equipment.
He wants his lesson to last a whole number of hours and to last as long as possible.

(c) How many hours will Brian's lesson last?

..... hours

(2)

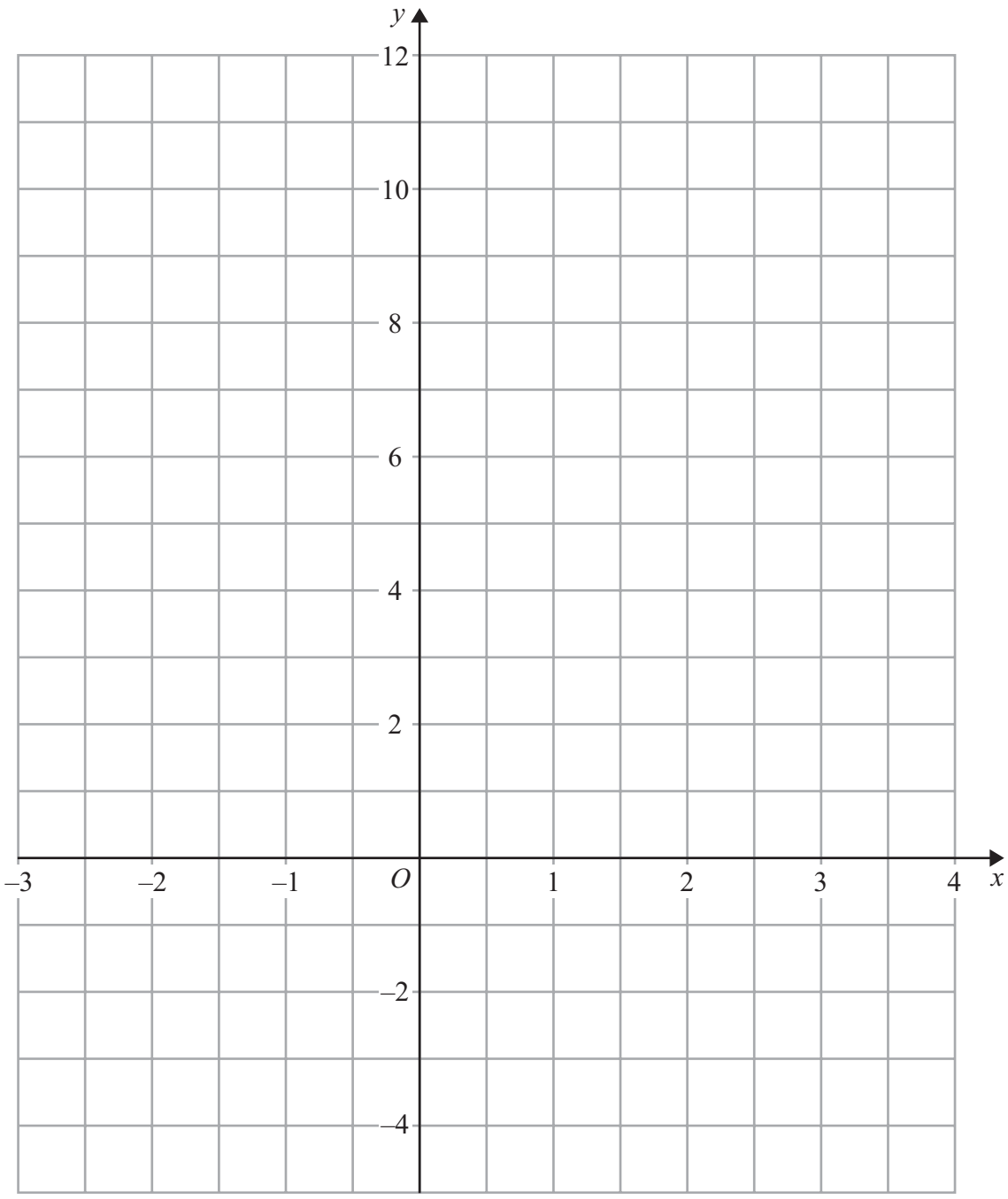
(Total for Question 7 is 5 marks)

8 (a) Complete the table of values for $y = 3x + 2$

x	–2	–1	0	1	2	3
y		–1	2			

(2)

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



(2)

(Total for Question 8 is 4 marks)

9 $x > 3$

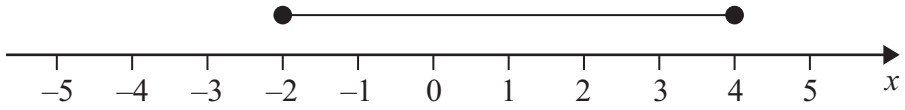
x is an integer.

(a) Write down one possible value of x.

.....

(1)

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

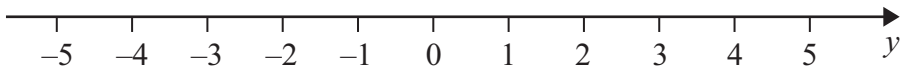


(b) Write down the inequality.

.....

(2)

(c) On the number line below, show the inequality $y < 3$



(2)

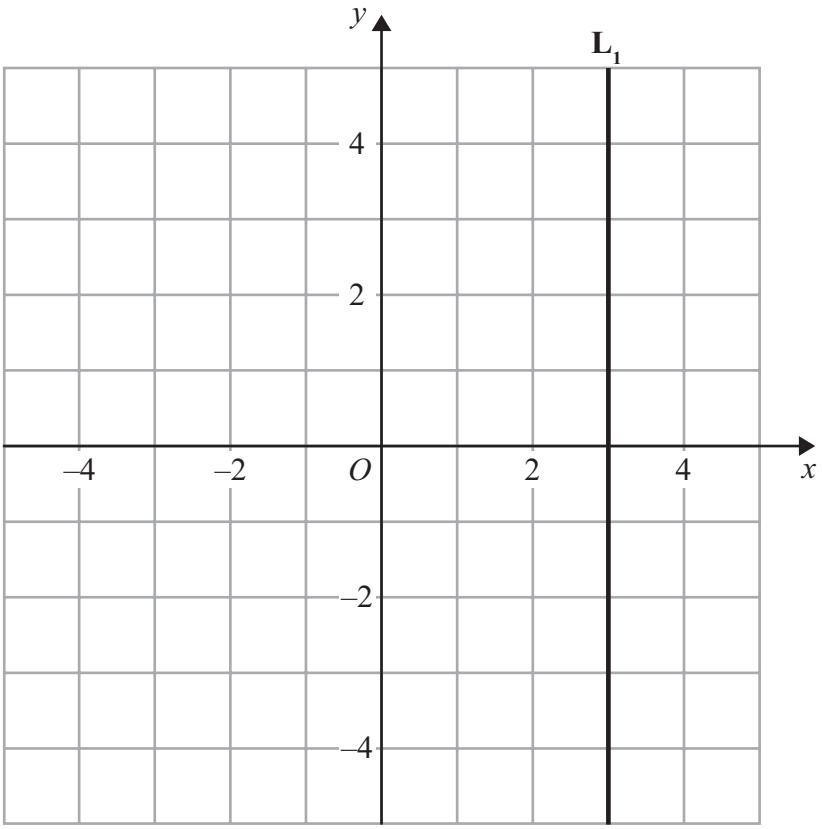
(d) Solve the inequality $\frac{3t}{2} + 4 > -3$

.....

(3)

(Total for Question 9 is 8 marks)

10 Here is a straight line $\mathbf{L_1}$ drawn on a grid.

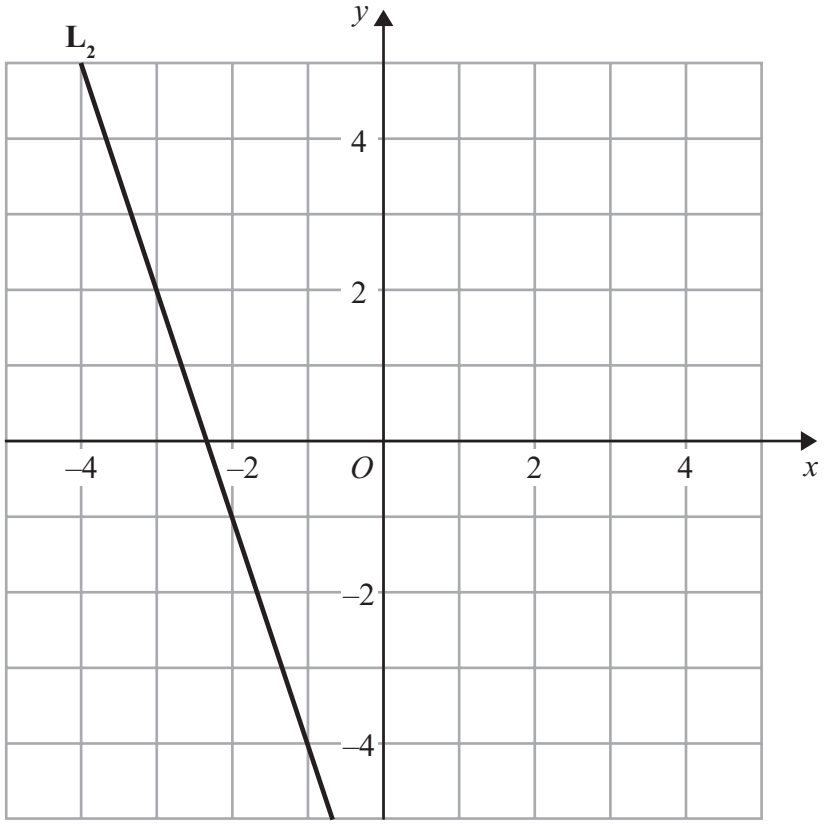


(a) Write down an equation of line $\mathbf{L_1}$

.....

(1)

Here is a straight line $\mathbf{L_2}$ drawn on a grid.



(b) Work out the gradient of $\mathbf{L_2}$

.....

(2)

(Total for Question 10 is 3 marks)

11 (a) The first two terms of a sequence are 3 and 5
Other terms of this sequence are worked out by using the rule

"add the two previous terms together".

Work out the 3rd and 4th terms of this sequence.

....

(2)

(b) The nth term of a different sequence is given by the expression $4n + 3$

(i) Find the 2nd and 3rd terms of this sequence.

....

51 is a term in this sequence.

(ii) Which term of this sequence is 51?

.....

(4)

(c) Here are the first four terms of an arithmetic sequence.

5 7 9 11

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

.....

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

.....

(3)

(Total for Question 11 is 9 marks)

12 (a) Factorise $15x - 5xy$

.....

(2)

(b) Factorise $14r^2 - 21r^3$

.....

(2)

(c) Factorise $2ty^2 + 10ty$

.....

(2)

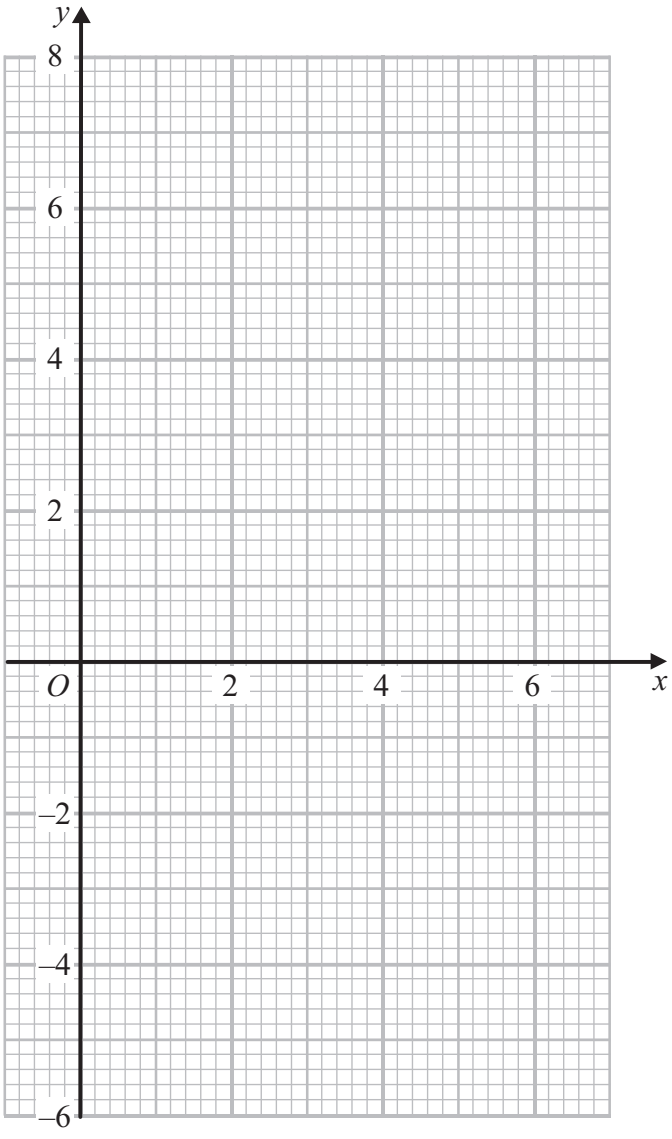
(Total for Question 12 is 6 marks)

13 (a) Complete the table of values for $y = (x - 3)^2 - 4$

x	0	1	2	3	4	5	6
y		0					5

(2)

(b) On the grid, draw the graph of $y = (x - 3)^2 - 4$ for values of x from 0 to 6



(2)

(c) Use your graph to find estimates for the solutions of $(x - 3)^2 - 4 = -2$

.....

(2)

(Total for Question 13 is 6 marks)

14 $y = x^2$

(a) Work out the value of y when $x = -4$

.....

(1)

$m = 5p^2 + 2$

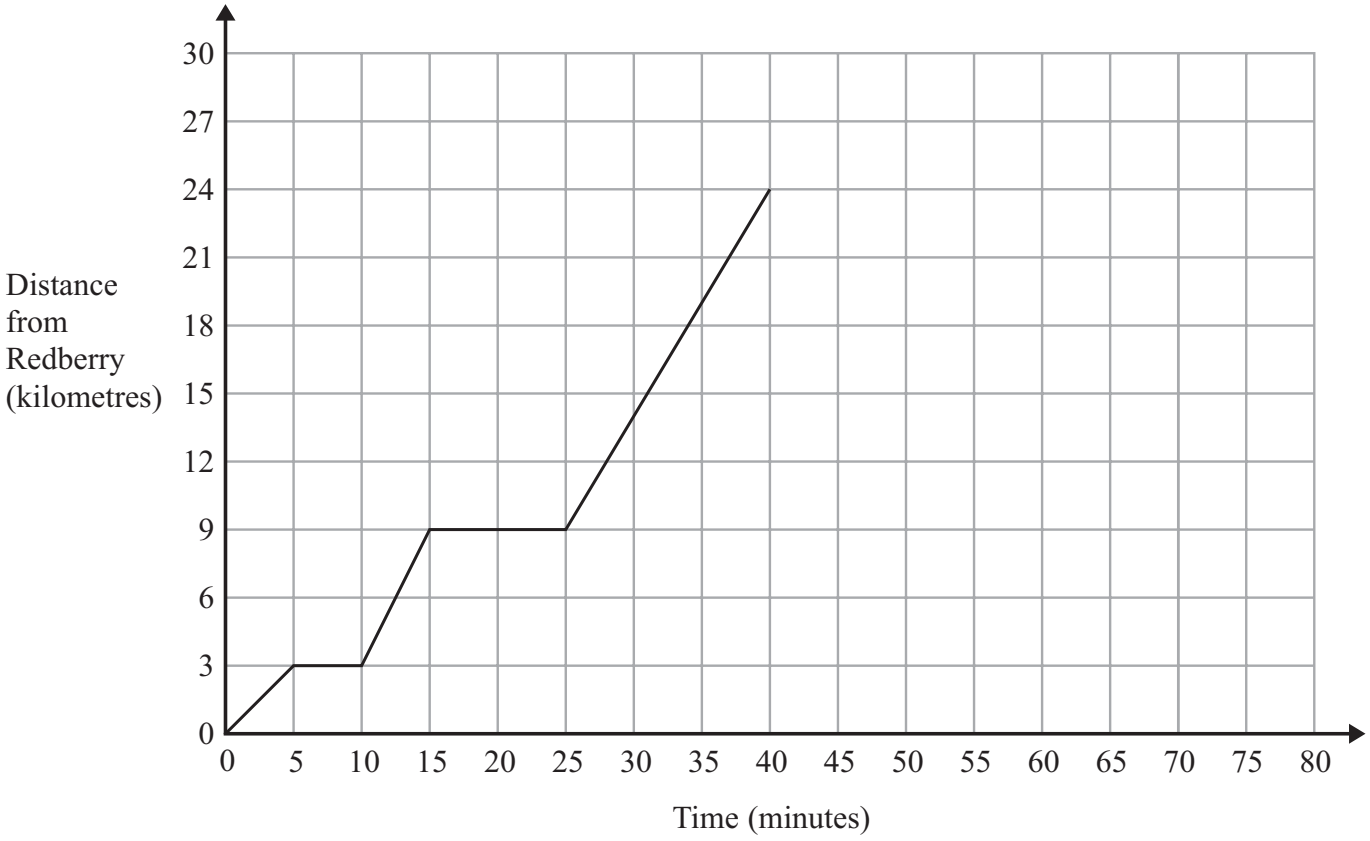
(b) Work out the value of m when $p = 3$

.....

(2)

(Total for Question 14 is 3 marks)

15 A coach travels from Redberry to Dunsfield.
The travel graph for this journey is shown below.



(a) Work out the speed, in kilometres per hour, for the first 5 minutes of the journey.

..... km/h
(2)

The coach stops twice on its journey to Dunsfield.

(b) Work out the total length of time, in minutes, for these two stops.

..... minutes
(2)

The coach stops at Dunsfield for 5 minutes.
It then returns to Redberry at a constant speed of 48 km/h.

(c) Represent this information on the travel graph.

(3)

(Total for Question 15 is 7 marks)

TOTAL FOR PAPER IS 80 MARKS