

Write your name here

Surname

Other names

**Pearson
Edexcel Award**

Centre Number

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Candidate Number

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**Algebra
Level 2
Calculator NOT allowed**

Thursday 14 January 2016 – 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.

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Turn over ►

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 (a) Simplify $3x + 2y - 4 + 5 - y + 2x$

.....
(2)

(b) (i) Simplify $p^3 \times p^2$

(ii) Simplify $t^6 \div t$

.....
(2)

(c) Expand $4r(3 + 2r)$

.....
(2)

(d) Expand and simplify $4(x - 3) + 3(2x + 7)$

.....
(2)

(Total for Question 1 is 8 marks)

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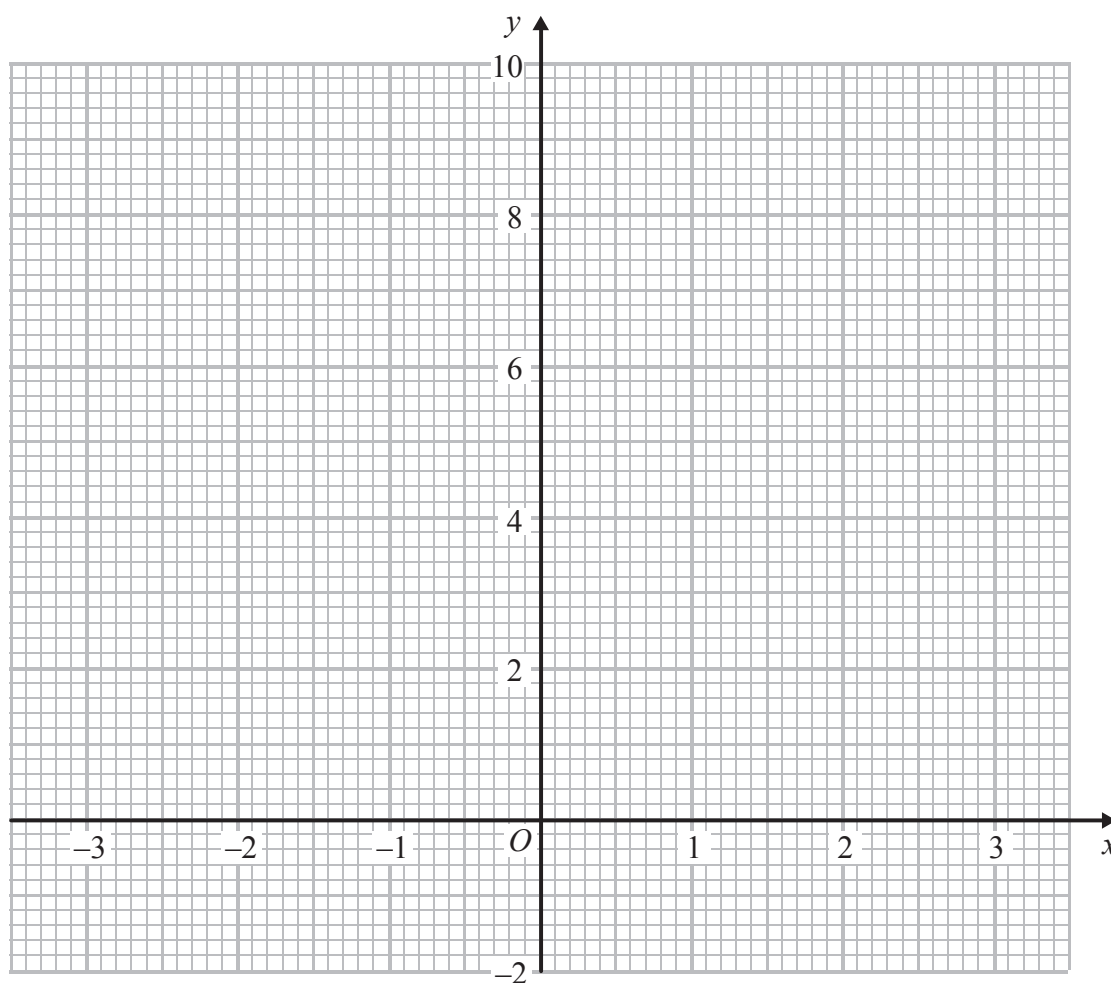
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2 (a) Complete the table of values for $y = 5 - x$

x	-3	-2	-1	0	1	2	3
y		7			4		

(2)

(b) On the grid, draw the line with equation $y = 5 - x$ for values of x from -3 to 3



(2)

(Total for Question 2 is 4 marks)



3 (a) Solve $7p = 42$

$$p = \dots\dots\dots (1)$$

(b) Solve $8f + 4 = 20$

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

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

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

(d) Solve $\frac{5y + 2}{3} = 2$

$$y = \dots\dots\dots (3)$$

(Total for Question 3 is 9 marks)



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4 Chocolates are sold in boxes and in tubes.
Each box contains 24 chocolates.
Each tube contains 7 chocolates.

Emilio buys p boxes of chocolates and q tubes of chocolates.

(a) Write down an expression, in terms of p and q , for the total number of chocolates Emilio buys.

.....
(2)

One box of chocolates costs $\pounds T$

(b) Write down an expression, in terms of T , for the total cost in pounds of 6 boxes of these chocolates.

.....
£.....
(1)

One box of chocolates costs $\pounds T$ and contains 24 chocolates.

(c) Write down an expression, in terms of T , for the cost in pence of each chocolate in the box.

..... pence
(2)

(Total for Question 4 is 5 marks)



5 Here is a formula $w = \frac{4t - 6}{3}$

(a) Find the value of w when $t = 3$

.....
(2)

(b) Make t the subject of the formula $w = \frac{4t - 6}{3}$

.....
(3)

Here is a different formula $d = \frac{a^2 + b}{2}$

(c) Find the value of b when $a = 5$ and $d = 12$

.....
(3)

(Total for Question 5 is 8 marks)

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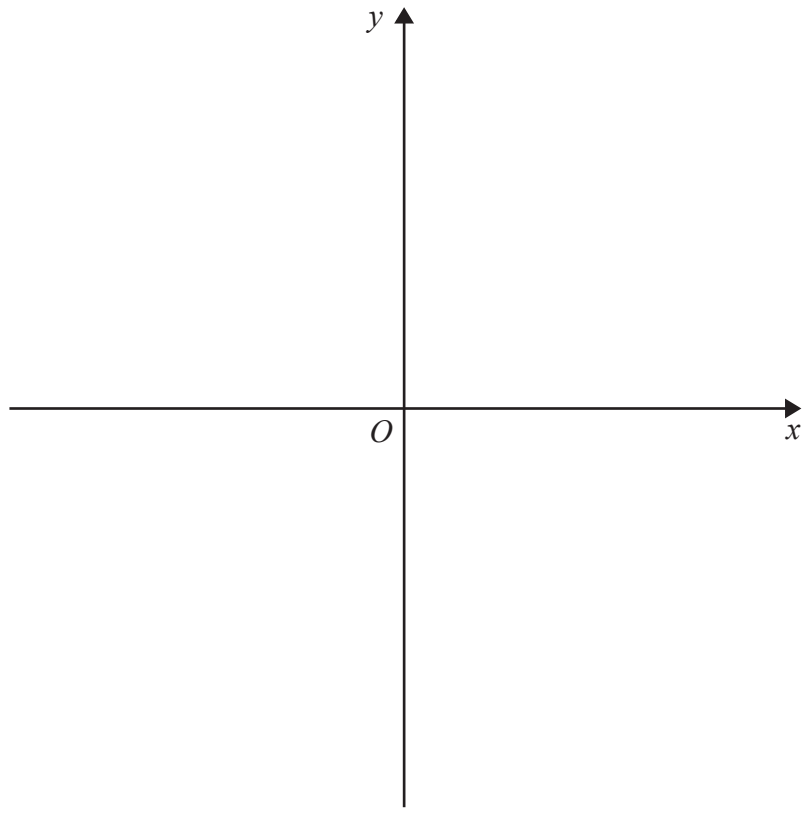


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6 (a) Sketch the graph of $y = 6x^2 - 3$



(3)

(b) For $y = 6x^2 - 3$, explain what happens to the value of y as the value of x becomes very large.

(1)

(Total for Question 6 is 4 marks)



7 (a) Factorise $3xy - 6x$

.....
(2)

(b) Factorise $6n^3 + 15n^2$

.....
(2)

(c) Factorise $r^2t^3 - r^2t^2$

.....
(2)

(Total for Question 7 is 6 marks)

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- 8 The first term of a sequence is 8
Other terms of this sequence are found by using the rule

“subtract 2 from the previous term and then divide by 2”

- (a) Write down the second and third terms of this sequence.

.....
(2)

Here are the first five terms of an arithmetic sequence.

58 66 74 82 90

- (b) Write down an expression, in terms of n , for the n th term of this sequence.

.....
(2)

- (c) The n th term of a different sequence is given by the expression $2n + 7$

- (i) Find the first and second terms of the sequence.

43 is a term of this sequence.

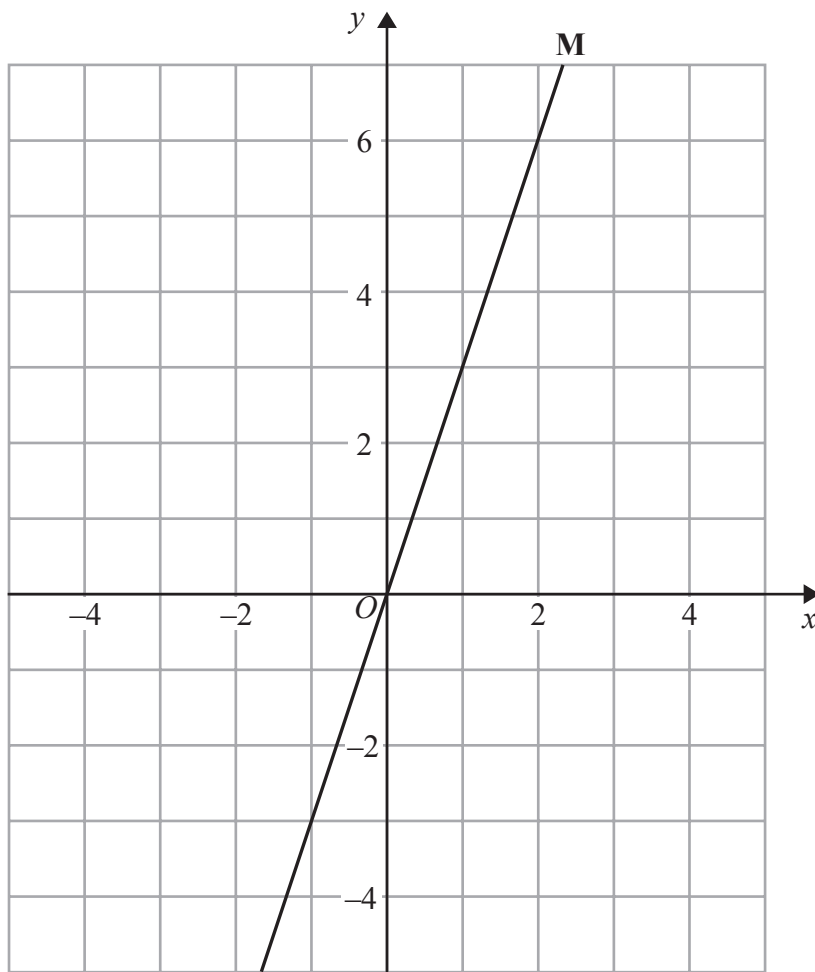
- (ii) Which term of this sequence is 43?

.....
(4)

(Total for Question 8 is 8 marks)



9 The straight line **M** is drawn on the grid below.



(a) Work out the gradient of **M**.

.....
(2)

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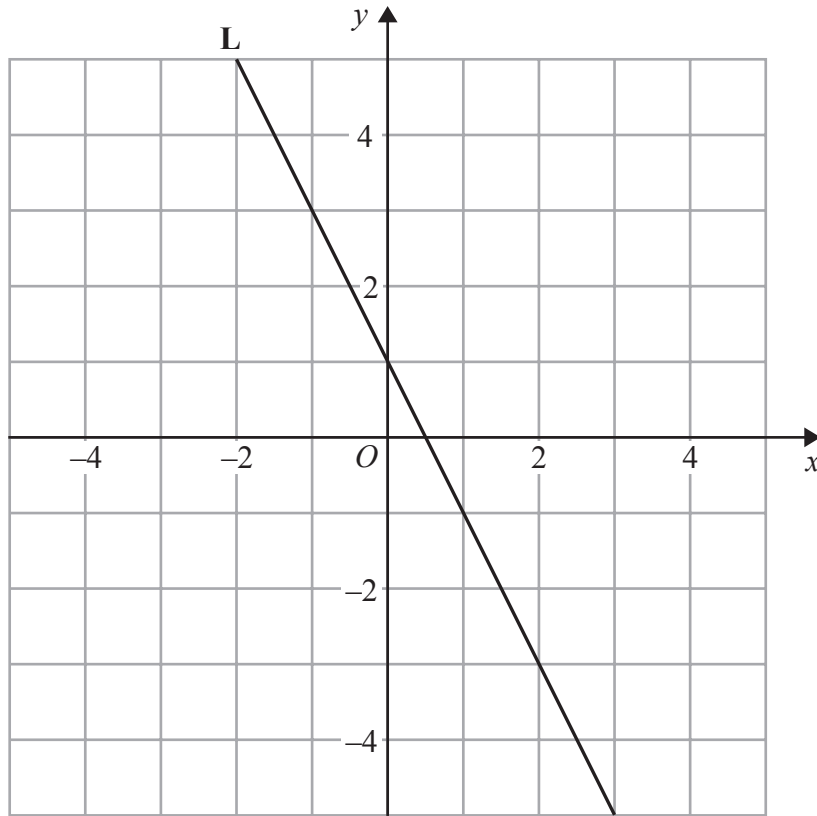


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The straight line **L** is drawn on the grid below.



(b) Find an equation of **L**.

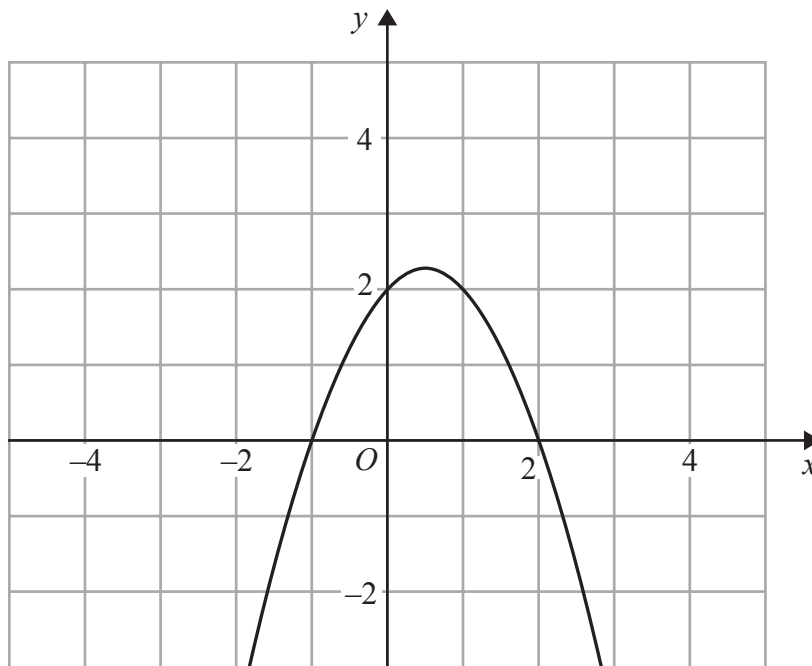
.....
(2)

(Total for Question 9 is 4 marks)



P 4 7 0 9 5 A 0 1 1 1 6

10 Here is the graph of $y = 2 + x - x^2$



Use this graph to solve the equation $2 + x - x^2 = 0$

(Total for Question 10 is 1 mark)

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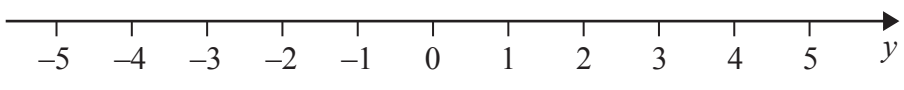


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11 (a) On the number line below, show the inequality $-1 \leq y < 3$



(2)

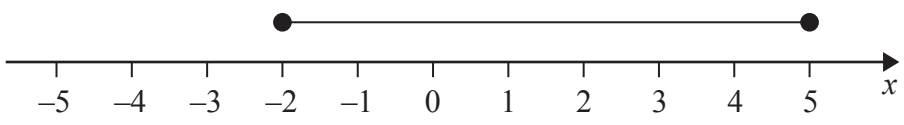
(b) $-7 < w < -2$

w is an integer.

Write down all possible values of w .

.....
(2)

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



Write down the inequality.

.....
(2)

(d) Solve the inequality $3m + 7 \geq 5 - m$

.....
(3)

(Total for Question 11 is 9 marks)

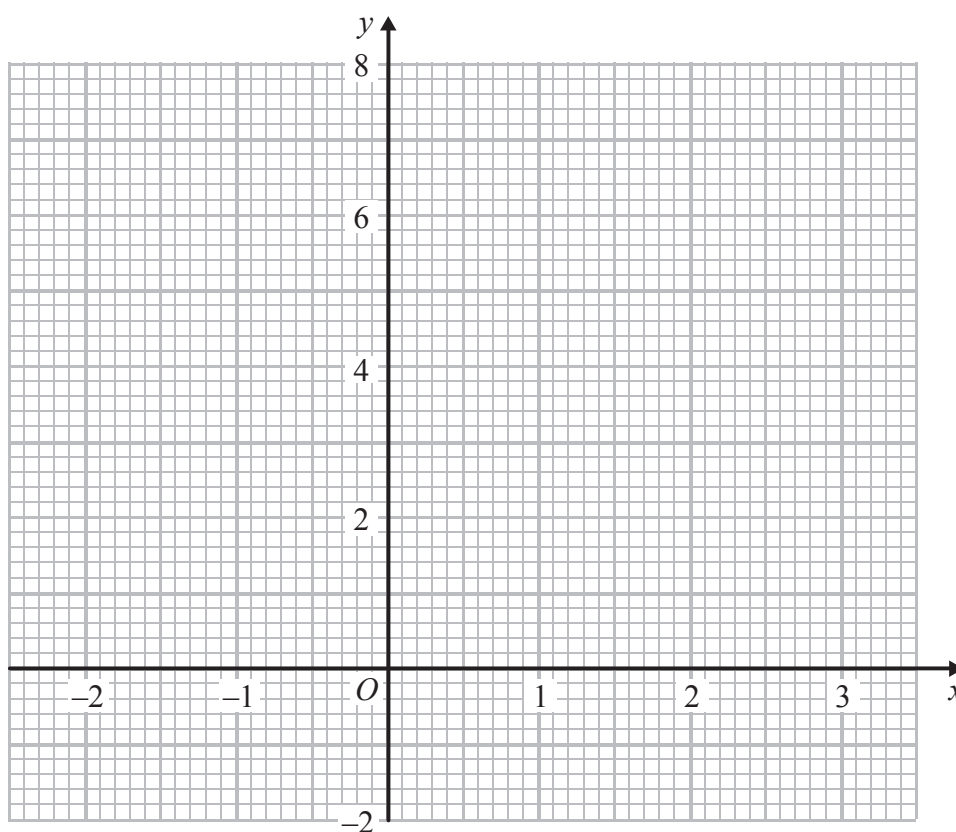


12 (a) Complete the table of values for $y = x^2 - x$

x	-2	-1	0	1	2	3
y	6		0			

(2)

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



(2)

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

(2)

(Total for Question 12 is 6 marks)



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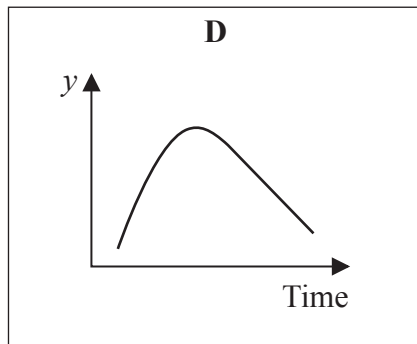
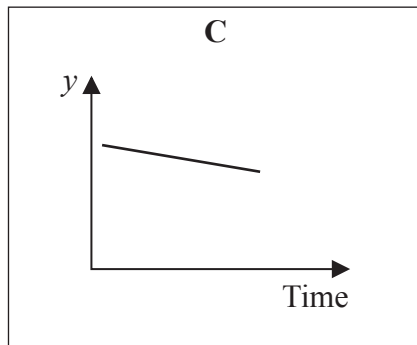
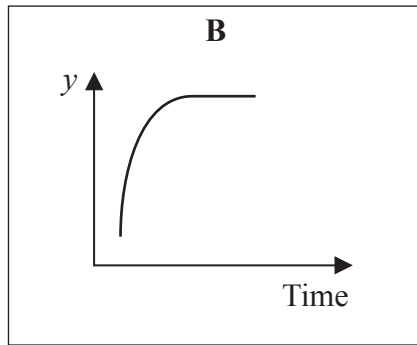
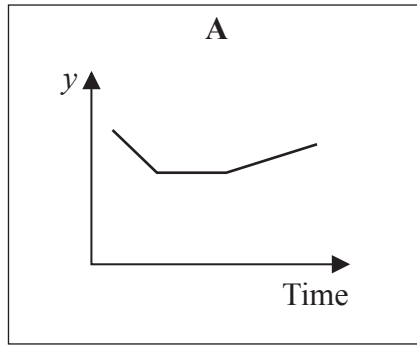
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13 Here are four statements and four sketch graphs. The graphs are labelled A, B, C and D.

Statement	Graph
The birth rate, y , increased over the last year and then remained constant.	
House prices, y , fell at a steady rate, then remained constant for a time and then increased.	
The price of crude oil, y , rose for a time and then fell at a steady rate.	
The number of people out of work, y , fell steadily.	

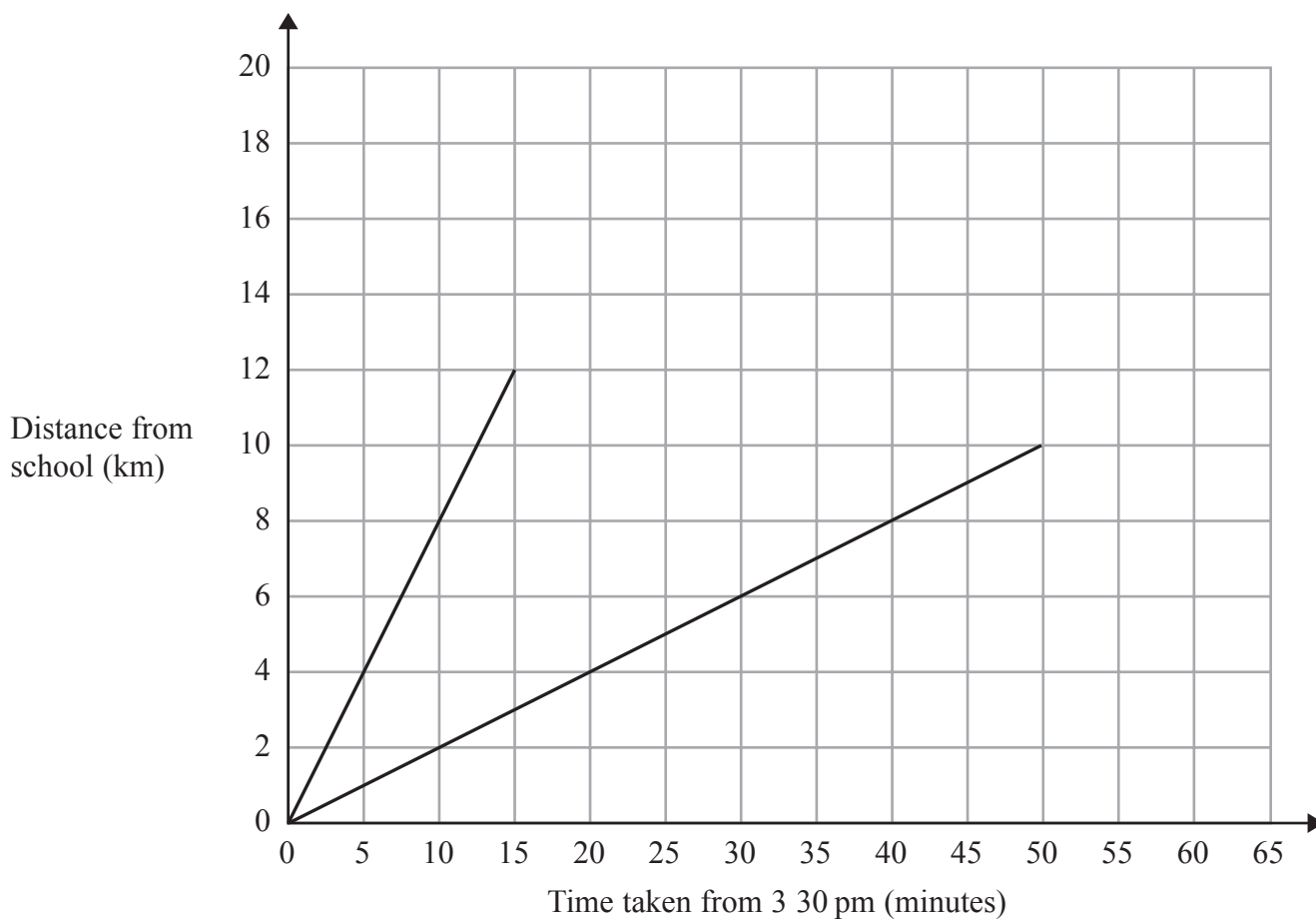
Write next to each statement the letter of the graph which best represents that statement.



(Total for Question 13 is 2 marks)



14 Jake and Kyle each leave school at 3 30 pm.
 They each go home.
 The travel graph for each journey is shown on the grid.



Jake travels home at a greater speed than Kyle.

(a) Label Jake's travel graph with the letter J.

(1)

(b) Work out the speed, in km/h, of Jake's journey home.

..... km/h

(2)

Jenny leaves school 10 minutes later than Jake and Kyle.
 Jenny travels 16 km in 30 minutes at a steady speed.
 She then stops for 10 minutes.

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

(3)

(Total for Question 14 is 6 marks)

TOTAL FOR PAPER IS 80 MARKS

