Write your name here

Surname	Other names

Pearson Edexcel Award

Centre Number	Candidate Number

Algebra

Level 2
Calculator NOT allowed

Thursday 12 January 2017 – 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 ▶

P48331A

6/6/6/6/

P 4 8 3 3 1 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 $3a + 7d + 3 + 2a + 2d + 5$

.....

(2)

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

.....

(ii) Simplify $y^6 \times y^2$

.....

(2)

(c) Expand $4(3n^2 + 5)$

.....

(2)

(d) Expand $5t(2 - 3t + t^2)$

.....

(2)

(Total for Question 1 is 8 marks)

2 In Rugby Union, a team scores

3 points for a penalty
5 points for a try

Saints score p penalties and t tries only.

(a) Write down an expression, in terms of p and t, for the total number of points scored by Saints.

.....

(2)

In Rugby Union, a team scores 3 points for a drop goal.
County scored a total of k points from drop goals.

(b) Write down an expression, in terms of k, for the number of drop goals County scored.

.....

(1)

(Total for Question 2 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

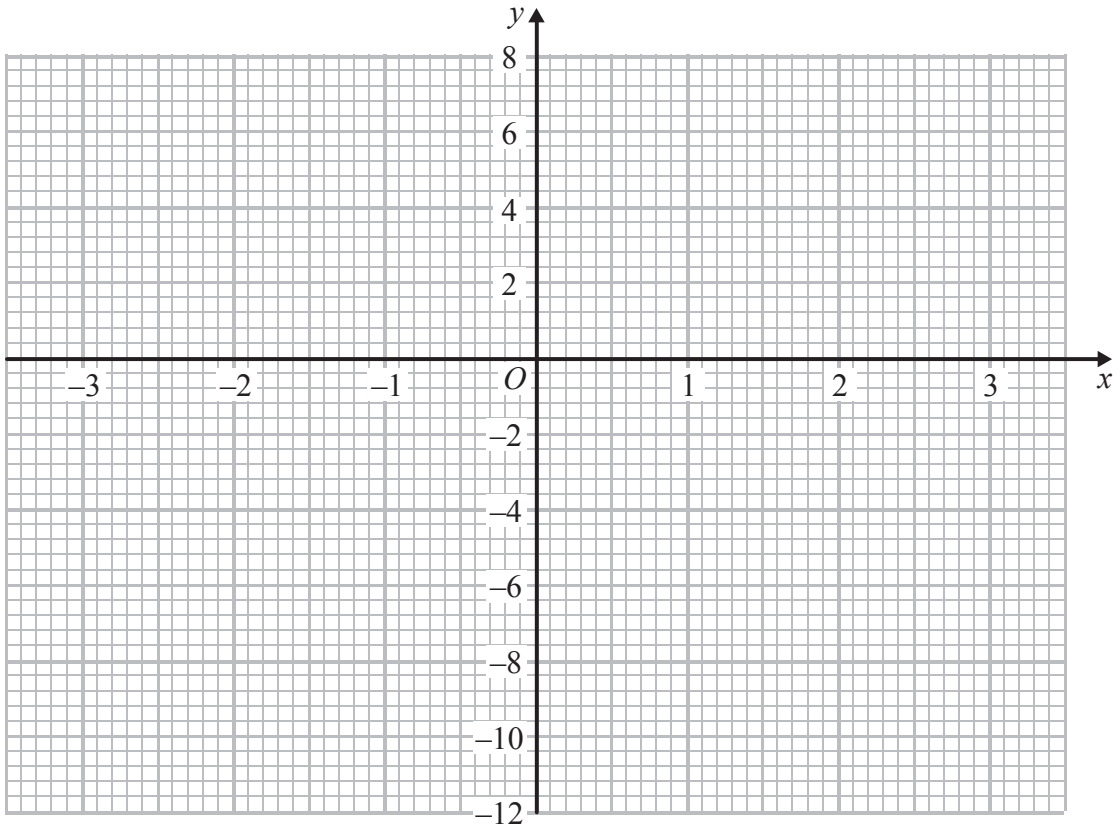
DO NOT WRITE IN THIS AREA

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

x	–3	–2	–1	0	1	2	3
y		–8			1		

(2)

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



(2)

(Total for Question 3 is 4 marks)

4 $v = \frac{1}{2}abh$

(a) Find the value of v when $a = 3$, $b = 4$ and $h = 5$

.....

(2)

(b) Make a the subject of the formula $v = \frac{1}{2}abh$

.....

(2)

(Total for Question 4 is 4 marks)

5 (a) Factorise $4ab - 8b$

.....

(2)

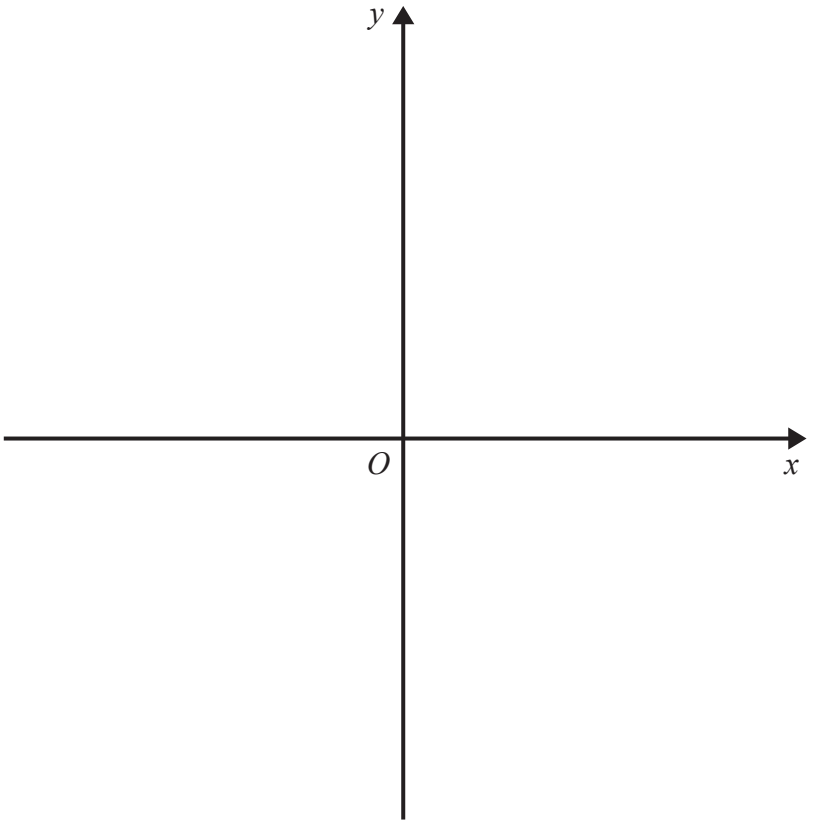
(b) Factorise $3x^2 + 15x$

.....

(2)

(Total for Question 5 is 4 marks)

6 (a) Sketch the graph of $y = x^2 - 16$



(3)

(b) For $y = x^2 - 16$, 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) Solve $4x = 84$

$x =$ .....

(1)

(b) Solve $7f - 12 = 30$

$f =$ .....

(2)

(c) Solve $5(2t + 3) = 30$

$t =$ .....

(3)

(d) Solve $\frac{2y + 3}{4} = 2y$

$y =$ .....

(3)

(Total for Question 7 is 9 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

8 (a) Expand and simplify $7(2a + 5) + 2(a - 3)$

.....

(2)

$F = 3(4g + 2) + 2(g - 4)$

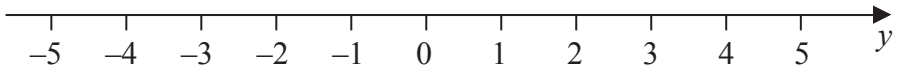
(b) Find the value of F when $g = 5$

.....

(2)

(Total for Question 8 is 4 marks)

9 (a) On the number line below, show the inequality $-3 < y < 2$



(2)

(b) $6 < t < 12$

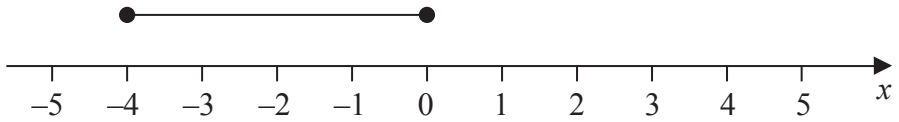
t is an integer.

Write down all the possible values of t.

.....

(2)

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



Write down the inequality.

.....

(2)

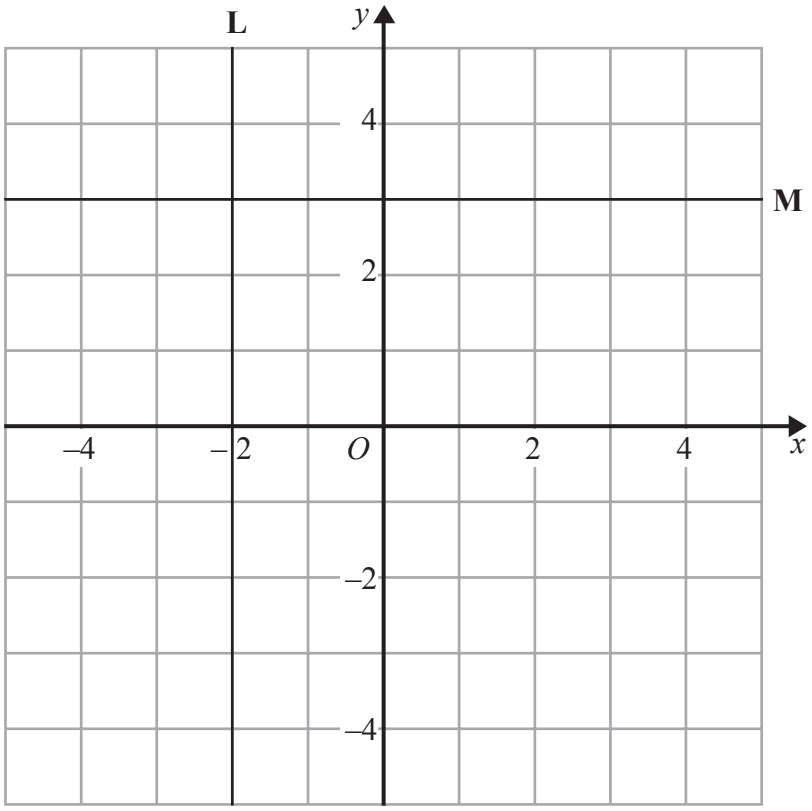
(d) Solve the inequality $\frac{2p + 7}{5} \geqslant 5$

.....

(3)

(Total for Question 9 is 9 marks)

10 The straight lines **L** and **M** are drawn on the grid below.



(a) (i) Write down an equation for **L**.

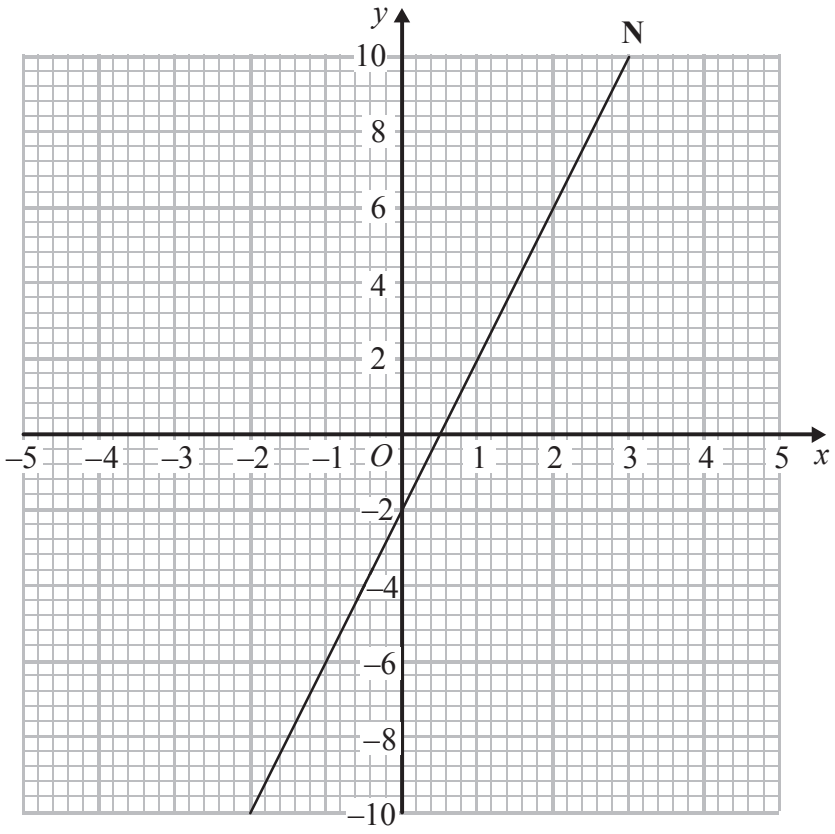
.....

(ii) Write down an equation for **M**.

.....

(2)

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



(b) Find an equation for **N**.

.....

(3)

(Total for Question 10 is 5 marks)

11 The nth term of an arithmetic sequence is given by the expression $3n - 5$

(a) (i) Work out the first two terms of this sequence.

....

58 is a term of this sequence.

(ii) Which term of this sequence is 58?

.....

(4)

Here are the first five terms of a different arithmetic sequence.

18 22 26 30 34

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

.....

(2)

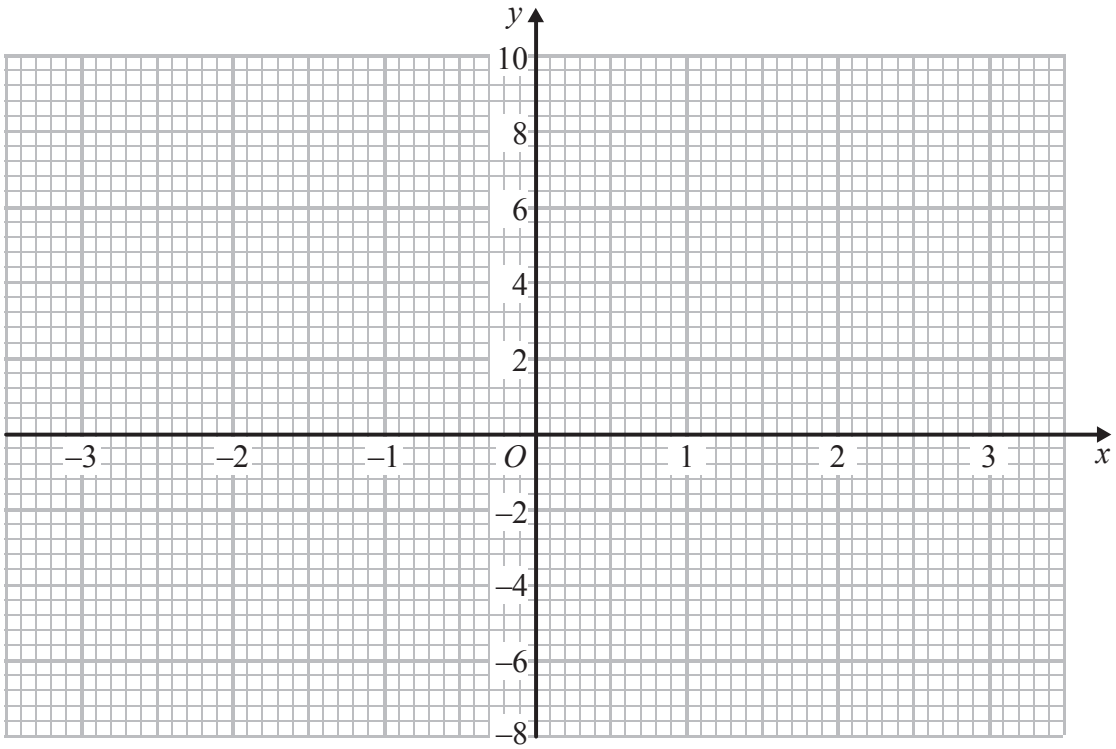
(Total for Question 11 is 6 marks)

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

x	–3	–2	–1	0	1	2	3
y	2			–4	–2		

(2)

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



(2)

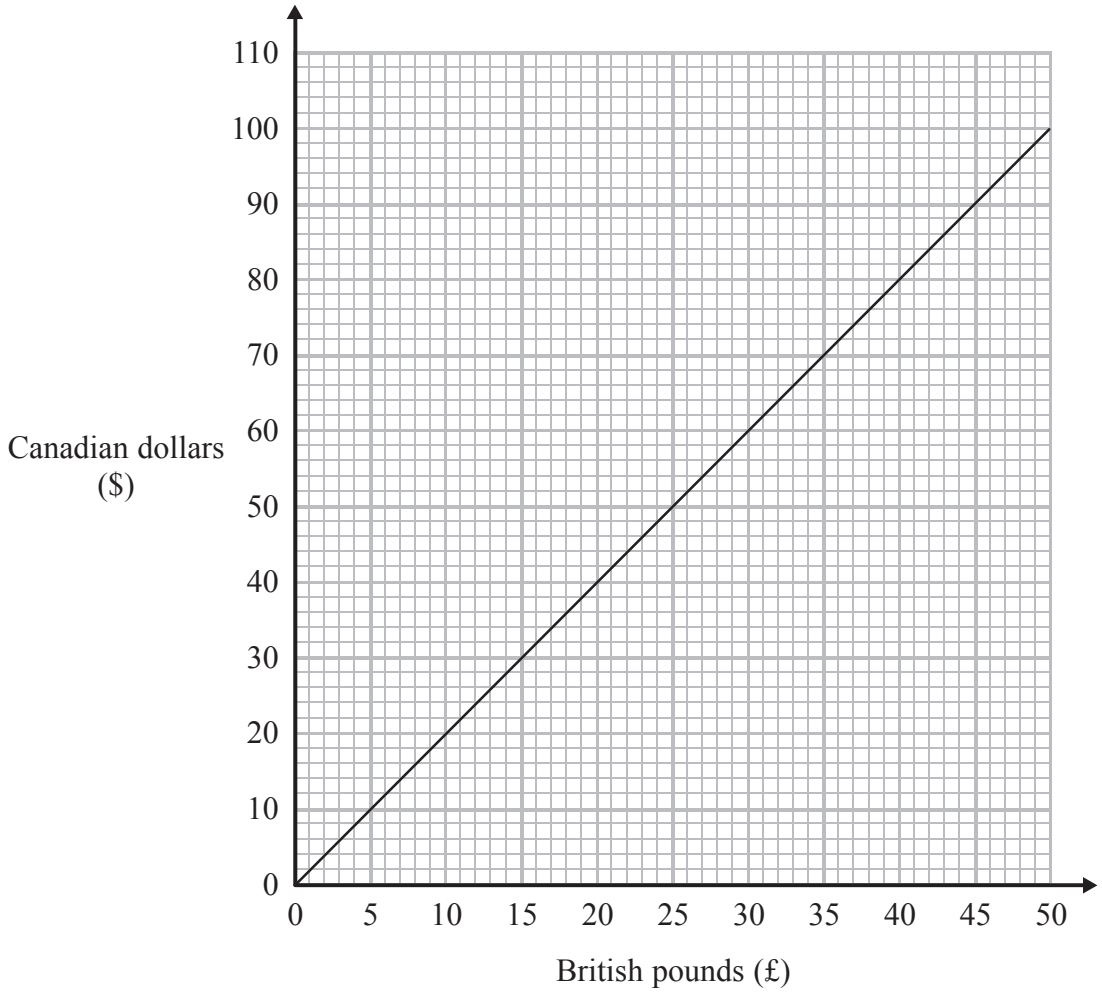
(c) Use your graph to find estimates for the solutions of $x^2 + x - 4 = 0$

.....

(2)

(Total for Question 12 is 6 marks)

13 This graph can be used to change between Canadian dollars ($) and British pounds (£).



(a) Change £30 into Canadian dollars.

$.....

(1)

(b) (i) Work out the gradient of the line.

.....

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

.....

(3)

(Total for Question 13 is 4 marks)

14 $g = x^2 - 6y$

$x = 4$

$y = \frac{1}{2}$

(a) Work out the value of g.

.....

(2)

$u = 4w - 7$

(b) Make w the subject of the formula.

.....

(2)

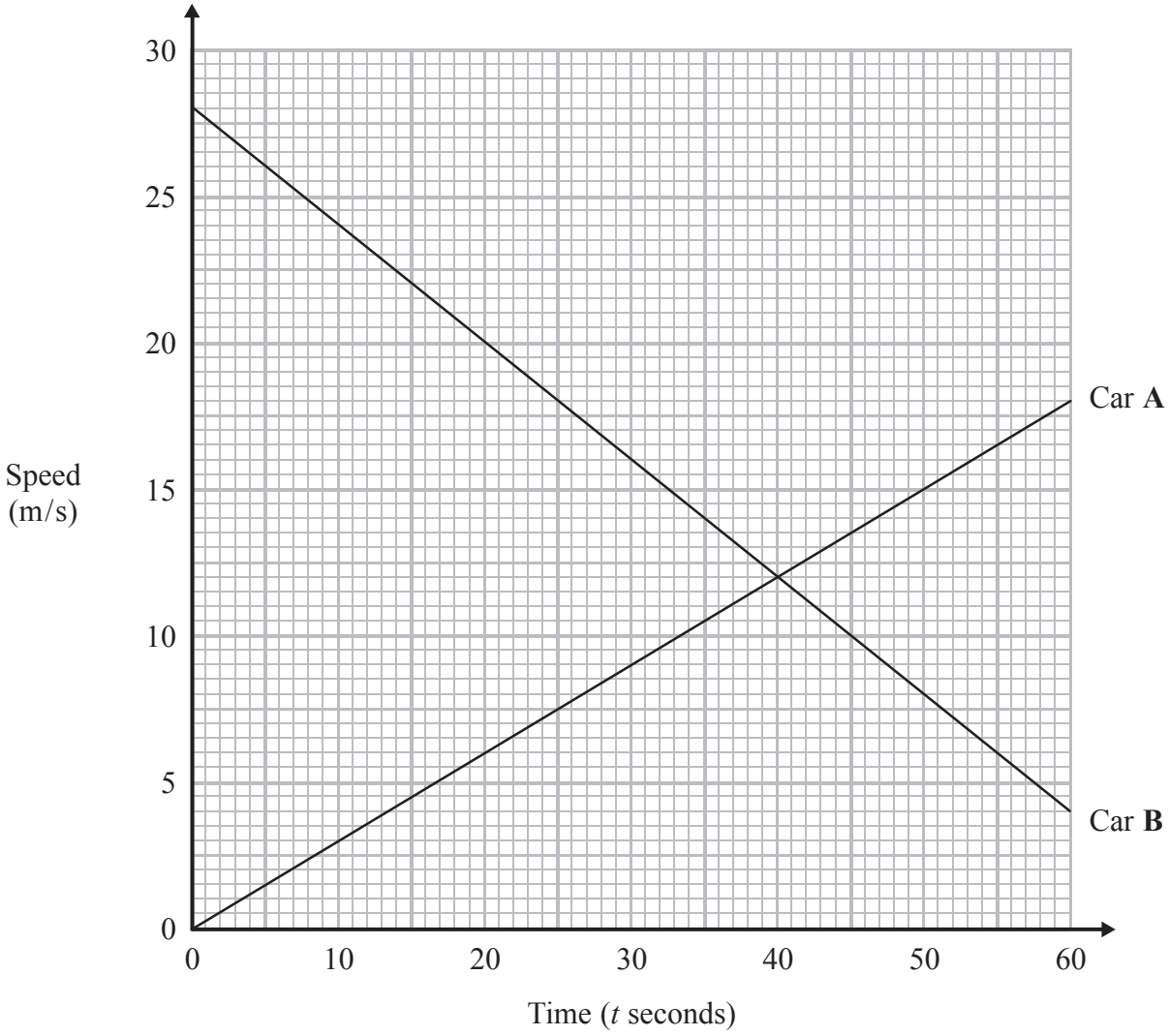
(Total for Question 14 is 4 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

15 The speed-time graph shows information about the speeds, at time t seconds, of two cars, car **A** and car **B**.



(a) Work out the difference between the speed of car **A** and the speed of car **B** when $t = 30$

..... m/s

(2)

(b) After how many seconds is the speed of car **A** equal to the speed of car **B**?

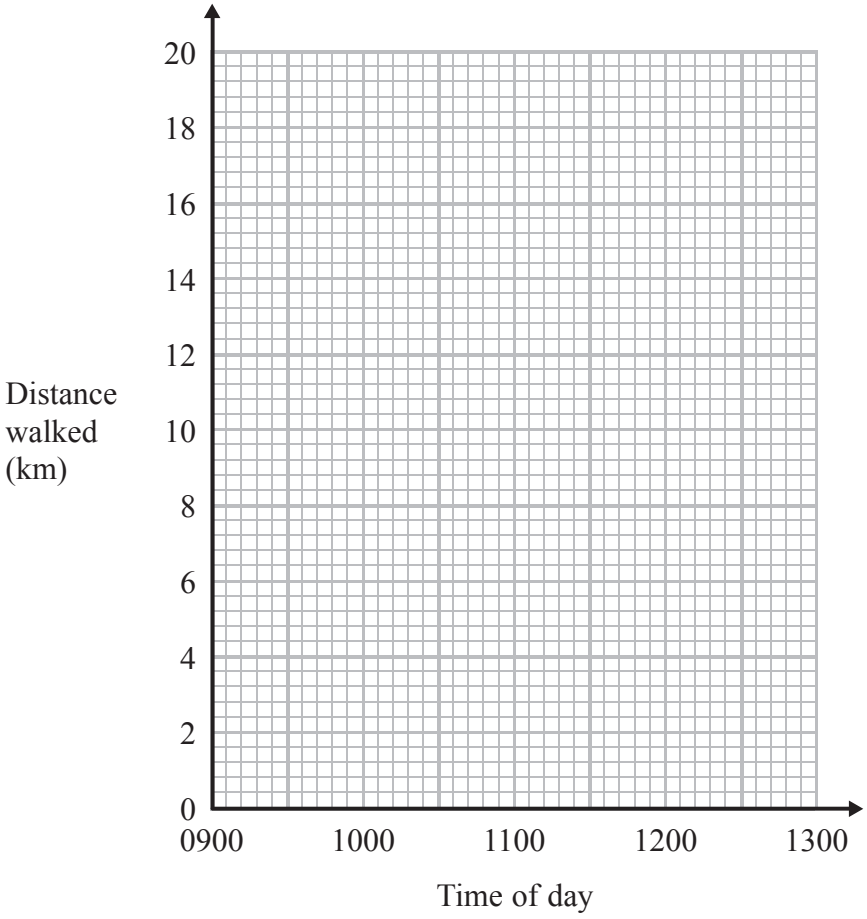
..... seconds

(1)

(Total for Question 15 is 3 marks)

16 John went for a walk.
He left home at 0900 and walked at a steady speed.
He walked 14 km in $2\frac{1}{2}$ hours.

(a) Show this information on the grid.



(1)

(b) Work out John's speed.

..... km/h

(2)

(Total for Question 16 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

BLANK PAGE

BLANK PAGE

BLANK PAGE