

Please check the examination details below before entering your candidate information

Candidate surname

Other names

**Pearson
Edexcel Award**

Centre Number

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Candidate Number

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Tuesday 7 May 2019

Morning (Time: 1 hour 30 minutes)

Paper Reference **AAL20/01**

Algebra

Level 2

Calculator NOT allowed

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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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 $m^2 + m^2 + m^2$

.....
(1)

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

.....
(1)

(c) Simplify $\frac{15n^5}{3n^3}$

.....
(1)

(d) Simplify $(4s^2t)^2$

.....
(2)

(Total for Question 1 is 5 marks)

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2 (a) Factorise $2t - 6$

.....
(1)

(b) Factorise $pw + pw^2$

.....
(2)

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

.....
(2)

(Total for Question 2 is 5 marks)



3 (a) Solve $3(f - 4) = 24$

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

(b) Solve $5g + 4 = 2g + 13$

$$g = \dots\dots\dots (2)$$

(c) Solve $\frac{1}{4}h - 3 = 5$

$$h = \dots\dots\dots (2)$$

(Total for Question 3 is 6 marks)



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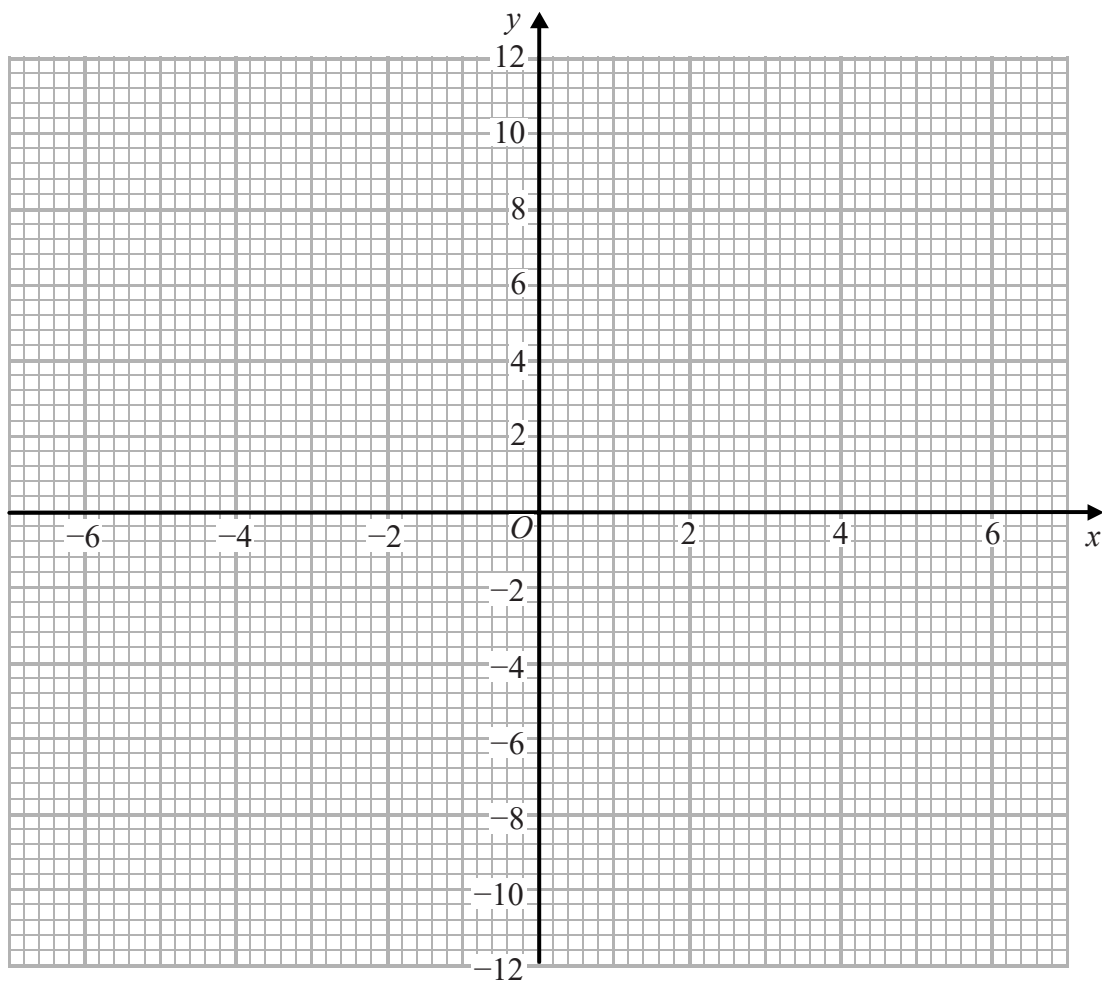
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4 (a) Complete the table of values for $y = \frac{3x}{2}$

x	-6	-4	-2	0	2	4	6
y						6	

(2)

(b) On the grid, draw the graph of $y = \frac{3x}{2}$ for values of x from -6 to 6



(2)

(Total for Question 4 is 4 marks)



- 5 The first term of a sequence is 6
Other terms of this sequence are found by using the rule

“multiply the previous term by 2 and subtract 5”

- (a) Write down the next two terms of this sequence.

.....,

(2)

Here are the first five terms of an arithmetic sequence.

55 49 43 37 31

- (b) (i) Work out the next term of this sequence.

.....

(1)

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

.....

(2)

The n th term of a different sequence is given by the expression $3(n - 4)$

- (c) Work out the 11th term of this sequence.

.....

(2)

(Total for Question 5 is 7 marks)



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6 (a) Expand $2x(y - 5)$

.....
(2)

(b) Expand and simplify $q^2(q + 2) + q(q - 4)$

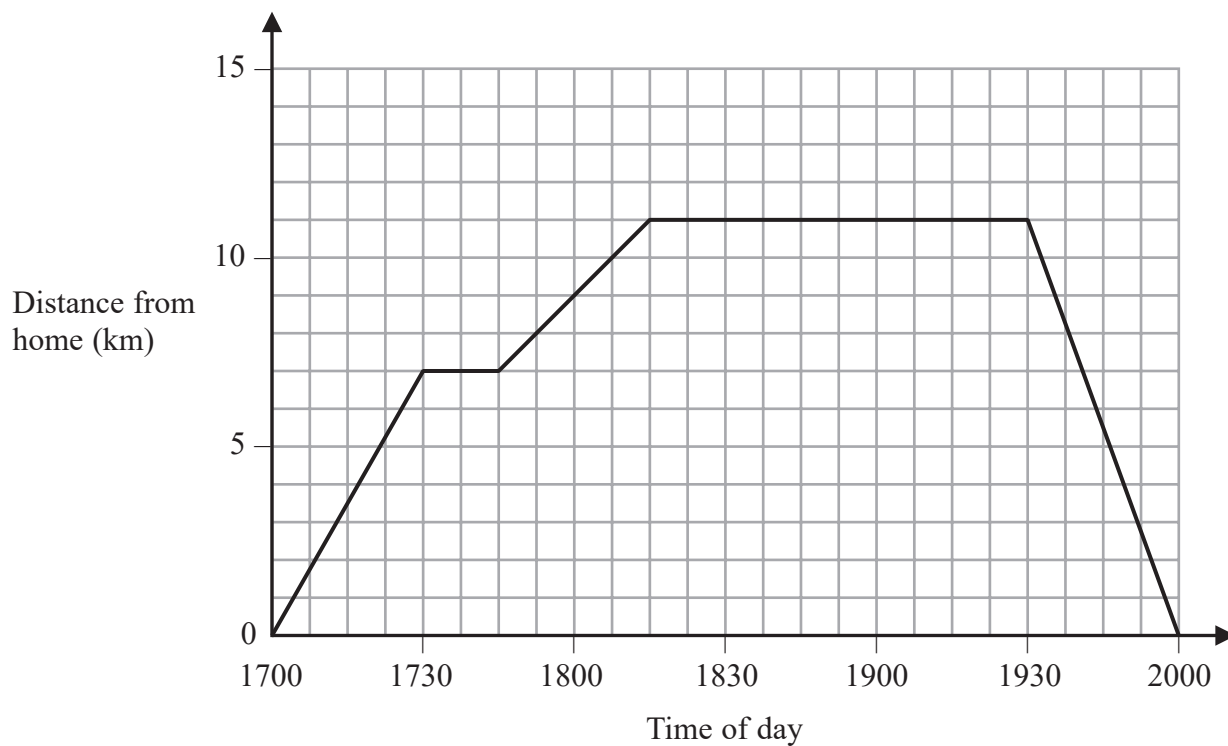
.....
(3)

(Total for Question 6 is 5 marks)



- 7 Sarah cycled from her home to a cinema.
She stopped at a friend's house on the way to the cinema.
Sarah also cycled back home from the cinema.

Here is the distance-time graph of her journey.



- (a) How far in total did Sarah cycle?

..... km
(2)

- (b) For how many minutes was Sarah at her friend's house?

..... minutes
(1)

- (c) Between which two times did Sarah cycle at the greatest speed?
Give a reason for your answer.

.....
.....
.....
(2)

(Total for Question 7 is 5 marks)

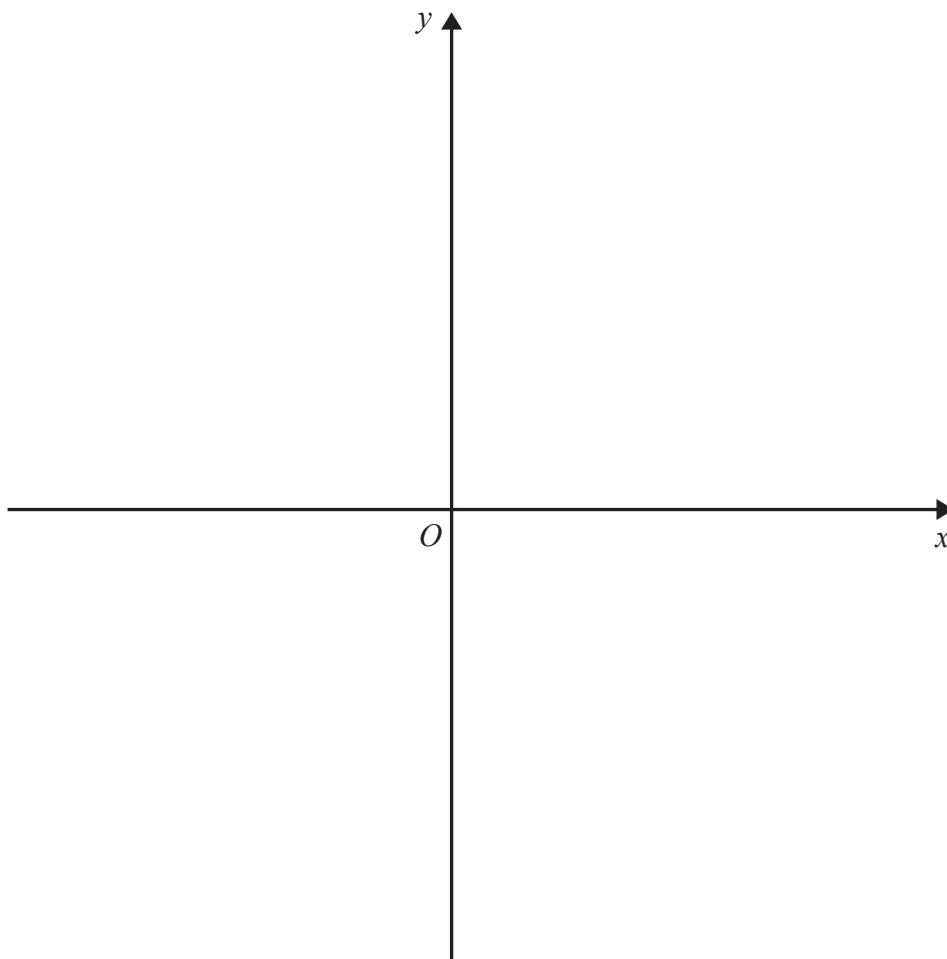


- 8 Place a tick in the appropriate column of the table to show whether each of the following is an equation, an expression or a formula.

	Equation	Expression	Formula
Perimeter = $4 \times$ length of side			
$5x + 2 = 14$			
$2h + 5$			

(Total for Question 8 is 2 marks)

- 9 (a) Using the axes below, sketch the graph of $y = x^2$
Label your graph **A**.



(2)

- (b) On the same axes, sketch the graph of $y = 3x^2$
Label this graph **B**.

(1)

(Total for Question 9 is 3 marks)



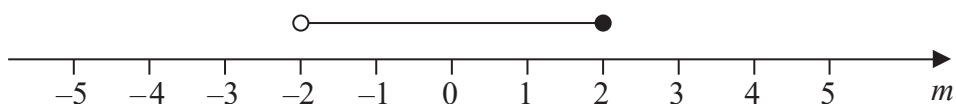
10 $-4 \leq n < 3$

n is an integer.

(a) Write down the greatest possible value of n .

.....
(1)

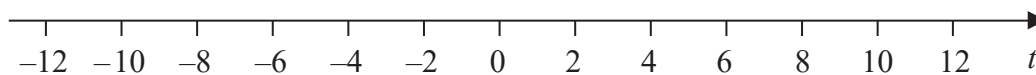
(b) Here is an inequality in m shown on a number line.



Write down the inequality.

.....
(2)

(c) On the number line below, show the inequality $-8 \leq t < 2$



(2)

(d) Solve the inequality $6 - w > 9$

.....
(2)

(Total for Question 10 is 7 marks)



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11 Megan buys some bags of fruit.

She buys

a bags of apples, each bag containing 4 apples

b bags of bananas, each bag containing 5 bananas

p bags of pears, each bag containing 7 pears

(a) Write down an expression for the total number of bags of fruit that Megan buys.

.....
(1)

(b) Write down an expression for the total number of apples, bananas and pears that Megan buys.

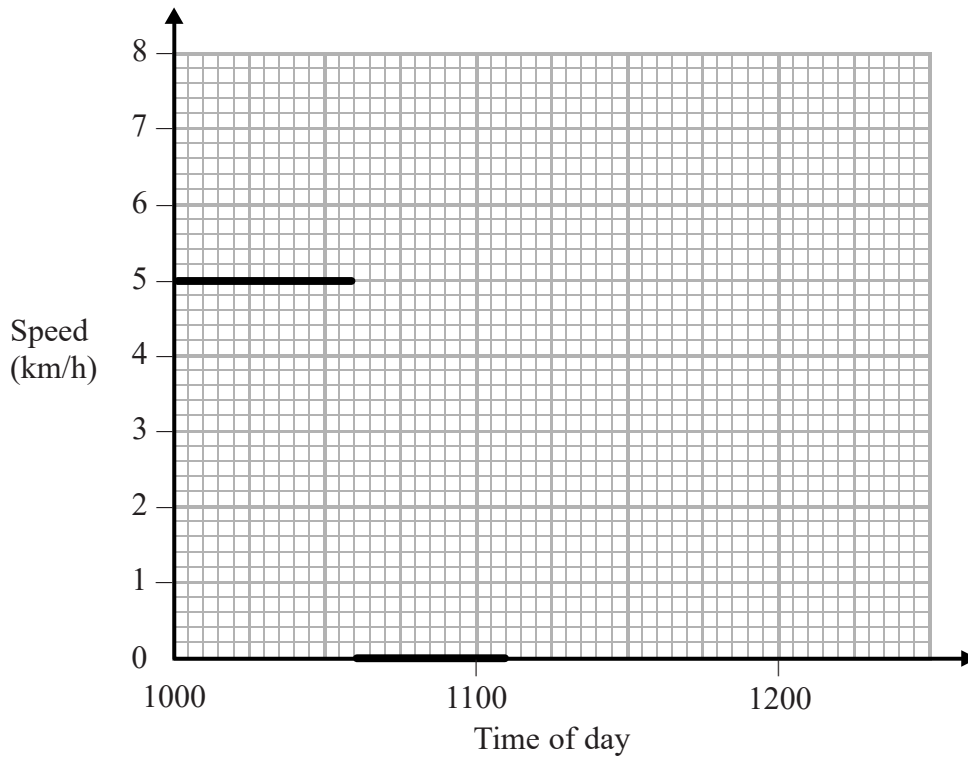
.....
(2)

(Total for Question 11 is 3 marks)



- 12 Dominic walks from his home to his friend's house at a constant speed of 5 km/h. He stops at his friend's house for 30 minutes.

The speed-time graph shows this information.



Dominic then walks home at a constant speed of 6 km/h. He arrives home at 1136

Show this information on the speed-time graph.

(Total for Question 12 is 1 mark)



13 $k = (m + 3)^2$

(a) (i) Work out the value of k when $m = 4$

.....
(2)

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

.....
(1)

(b) Make d the subject of the formula $c = 5d - 8$

.....
(2)

$p = n^3$

(c) (i) Find the value of p when $n = 5$

.....
(1)

(ii) Find the value of n when $p = 8$

.....
(1)

(Total for Question 13 is 7 marks)



14 Rayheem threw a ball vertically upwards.

The height of the ball above the ground, h metres, at a time t seconds after the ball has been thrown is given by the formula

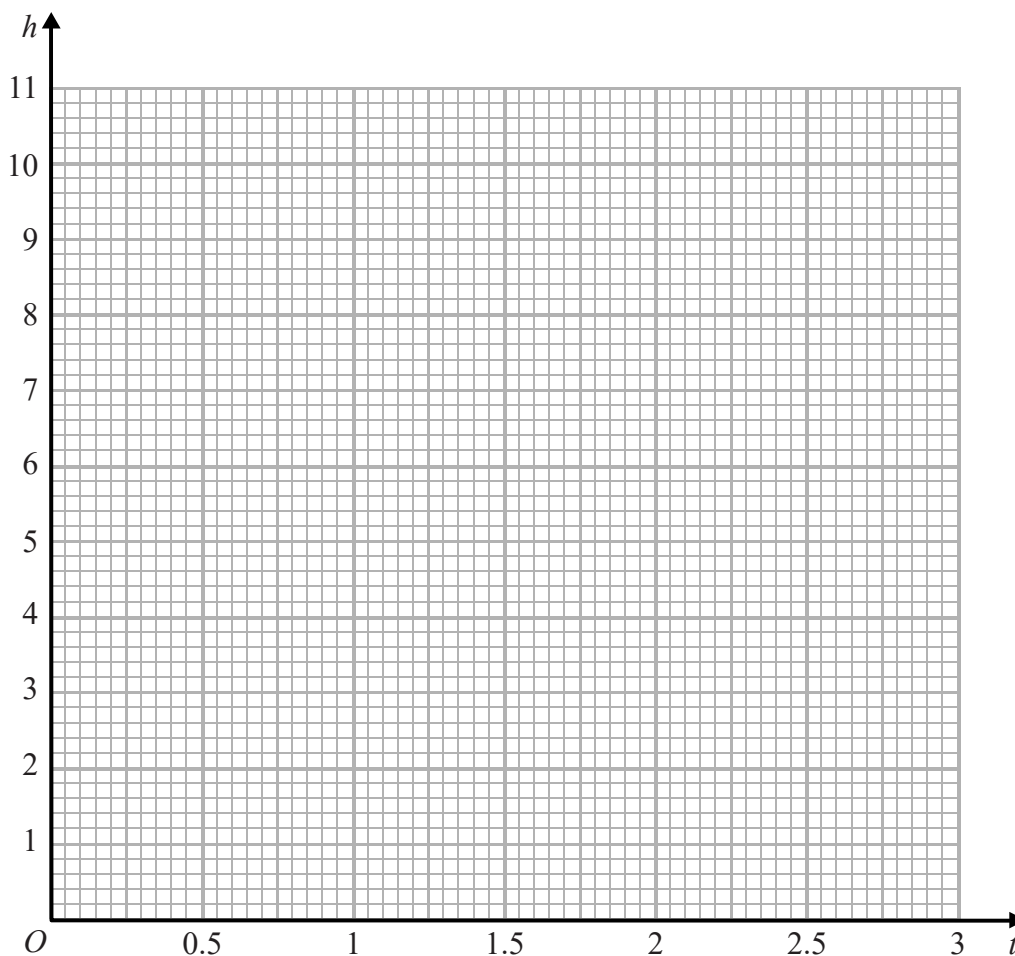
$$h = 1 + 14t - 5t^2$$

(a) Complete the table of values for $h = 1 + 14t - 5t^2$

t	0	0.5	1	1.5	2	2.5
h		6.75		10.75		4.75

(2)

(b) On the grid below, draw the graph of $h = 1 + 14t - 5t^2$ for values of t from 0 to 2.5



(2)



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(c) Use the graph to find an estimate of the height of the ball above the ground 2.3 seconds after the ball was thrown.

..... m
(1)

There are two times when the ball was 8 metres above the ground.

(d) Write down these two times.

..... s , s
(2)

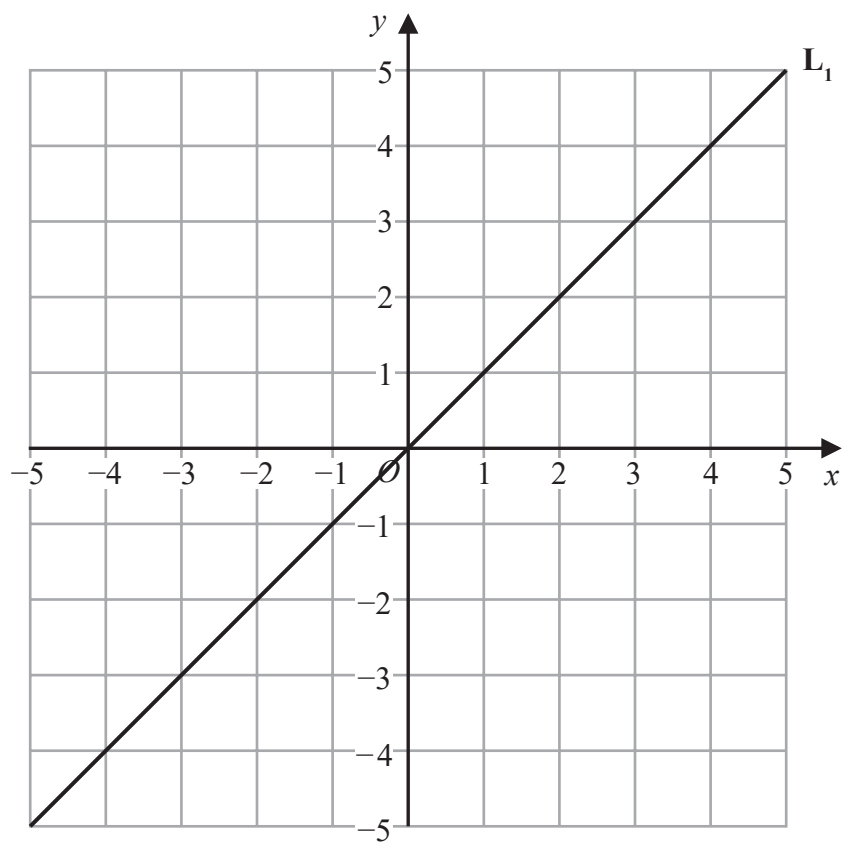
(e) Hence, write down one solution of the equation $1 + 14t - 5t^2 = 8$

.....
(1)

(Total for Question 14 is 8 marks)



15 Here is a straight line L_1 drawn on a grid.



(a) Write down an equation for L_1

.....
(1)

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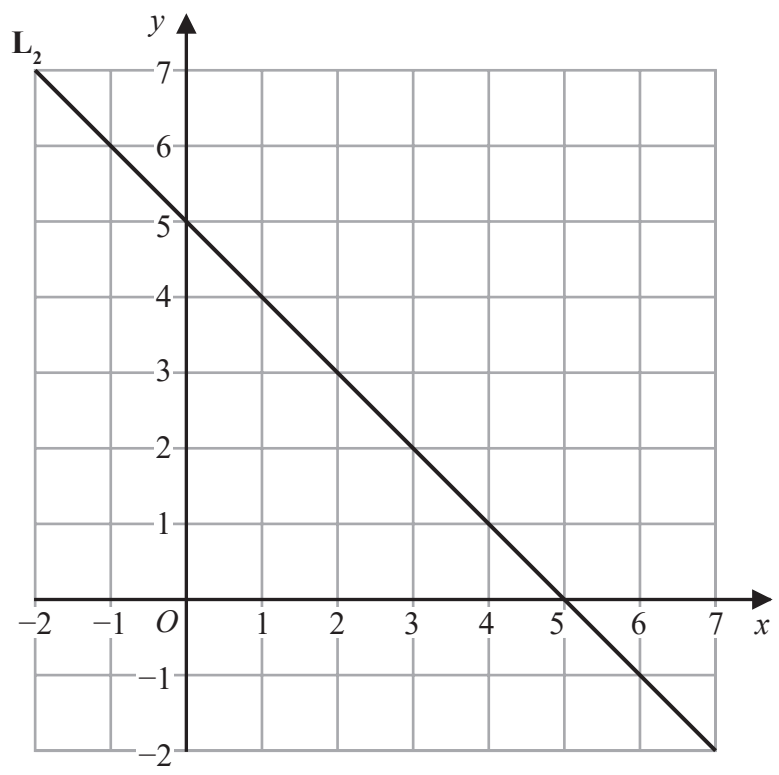


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Here is a straight line L_2 drawn on a grid.



(b) Find an equation for L_2

.....
(2)

(Total for Question 15 is 3 marks)



16 (a) Solve $5(2 - y) + 2(3y + 1) = 0$

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

(b) Solve $\frac{w}{3} = \frac{2w + 6}{2}$

$w = \dots\dots\dots$
(3)

(Total for Question 16 is 6 marks)

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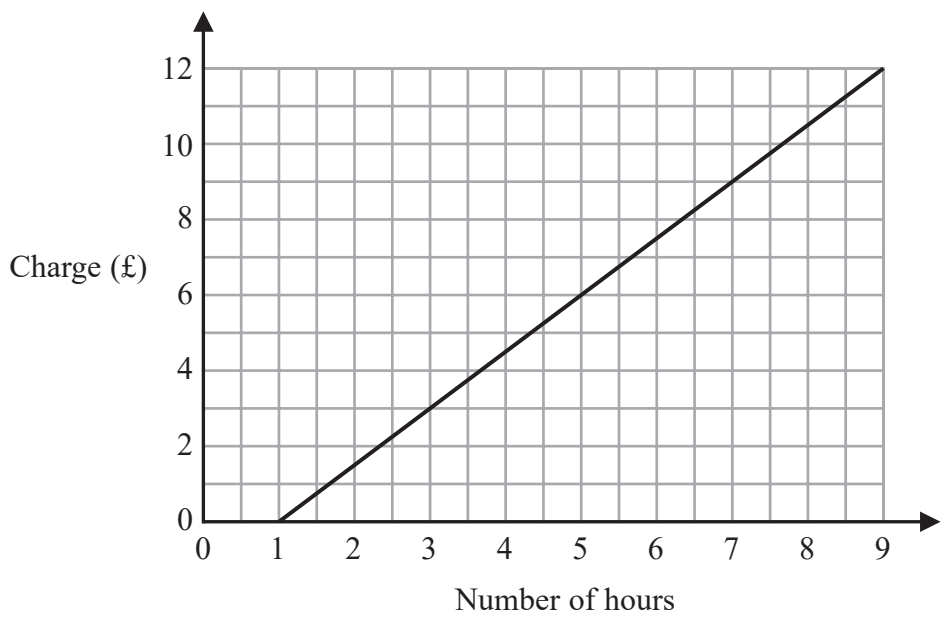


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17 This graph can be used to find the charge for parking a car in a car park for up to 9 hours. There is no charge for parking a car for one hour or less.



(a) Work out the gradient of the graph.

.....
(2)

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

.....
.....
.....
(1)

(Total for Question 17 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS



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