

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel Award

Algebra

Level 2

Calculator NOT allowed

Monday 13 May 2013 – 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 $p^2 \times p^5$

.....
(1)

(b) Simplify $q^6 \div q^4$

.....
(1)

(c) Simplify $(t^3)^2$

.....
(1)

(d) Simplify $\frac{12a^3b^2}{4ab}$

.....
(2)

$d = c^3$

$c = -2$

(e) Work out the value of d .

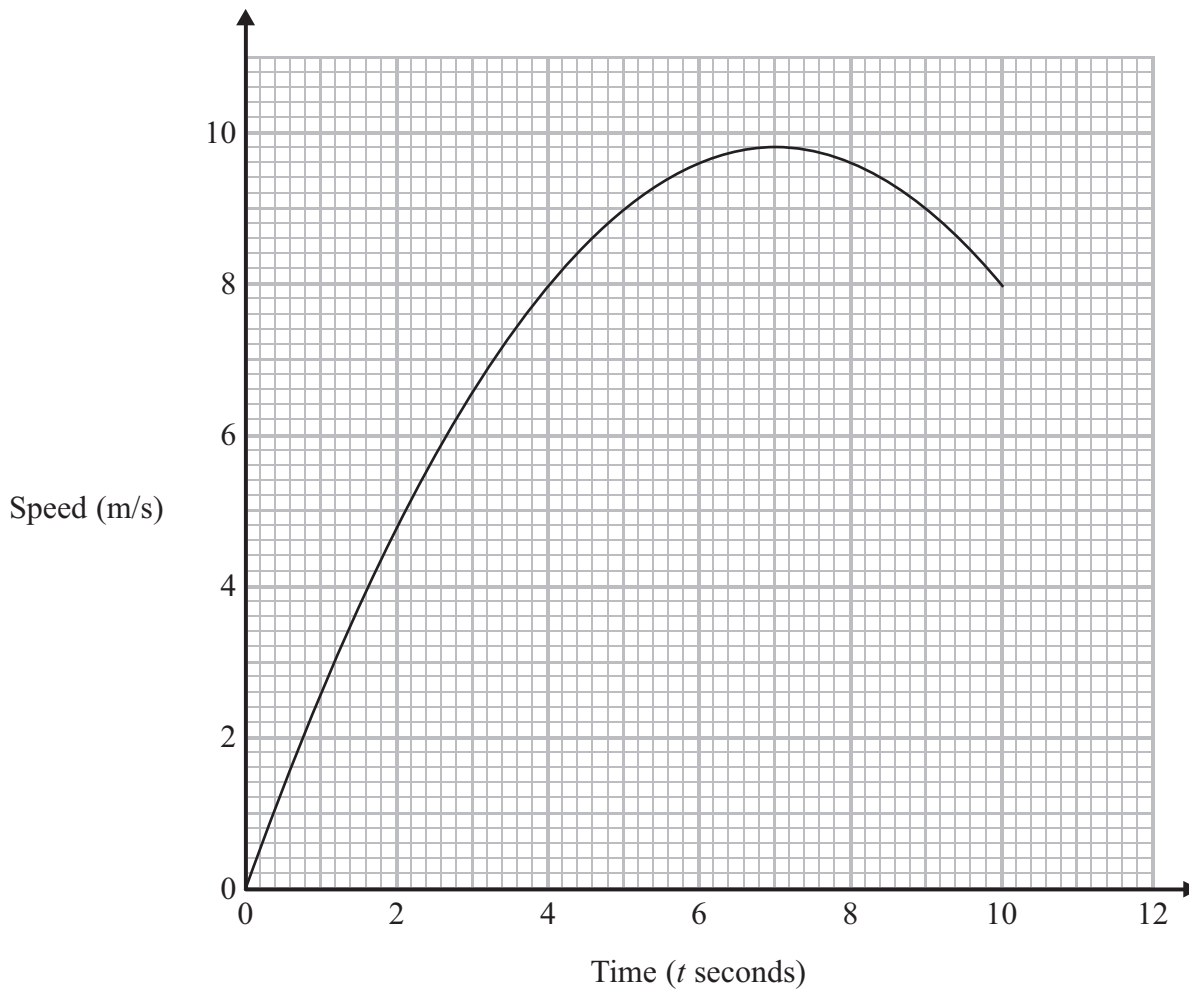
.....
(2)

(Total for Question 1 is 7 marks)



2 Bethan runs in a race.

The graph shows her speed, in metres per second, t seconds after the start of the race.



(a) Write down Bethan's speed 2 seconds after the start of the race.

..... m/s
(1)

(b) Write down Bethan's greatest speed.

..... m/s
(1)

There are two times when Bethan's speed is 9 m/s.

(c) Write down these two times.

..... seconds and seconds
(2)

(Total for Question 2 is 4 marks)



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

.....
(2)

(b) Expand $3k(2 - 5k)$

.....
(2)

(c) Expand $w^3(w - w^3)$

.....
(2)

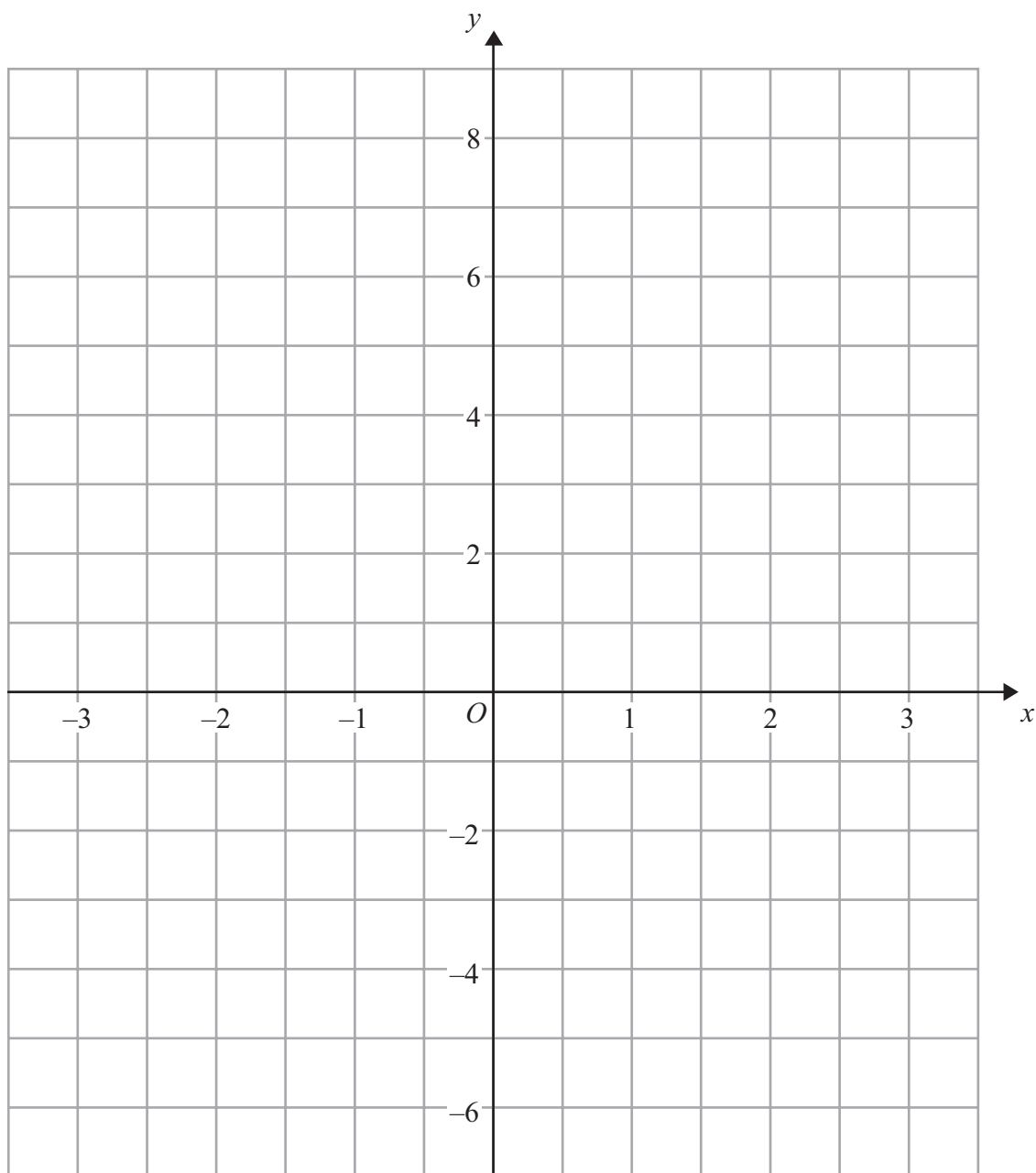
(d) Expand and simplify $3(y - 2) + 5(2y + 1)$

.....
(2)

(Total for Question 3 is 8 marks)



4 On the grid, draw the graph of $y = 2x + 1$ for values of x from $x = -3$ to $x = 3$



(Total for Question 4 is 3 marks)



5 (a) Solve $\frac{4p}{5} = 20$

$p = \dots\dots\dots$
(2)

(b) Solve $2t - 15 = 3$

$t = \dots\dots\dots$
(2)

(c) Solve $5(x + 1) = 3x$

$x = \dots\dots\dots$
(2)

(Total for Question 5 is 6 marks)



6 (a) Factorise $12k + 4$

.....
(2)

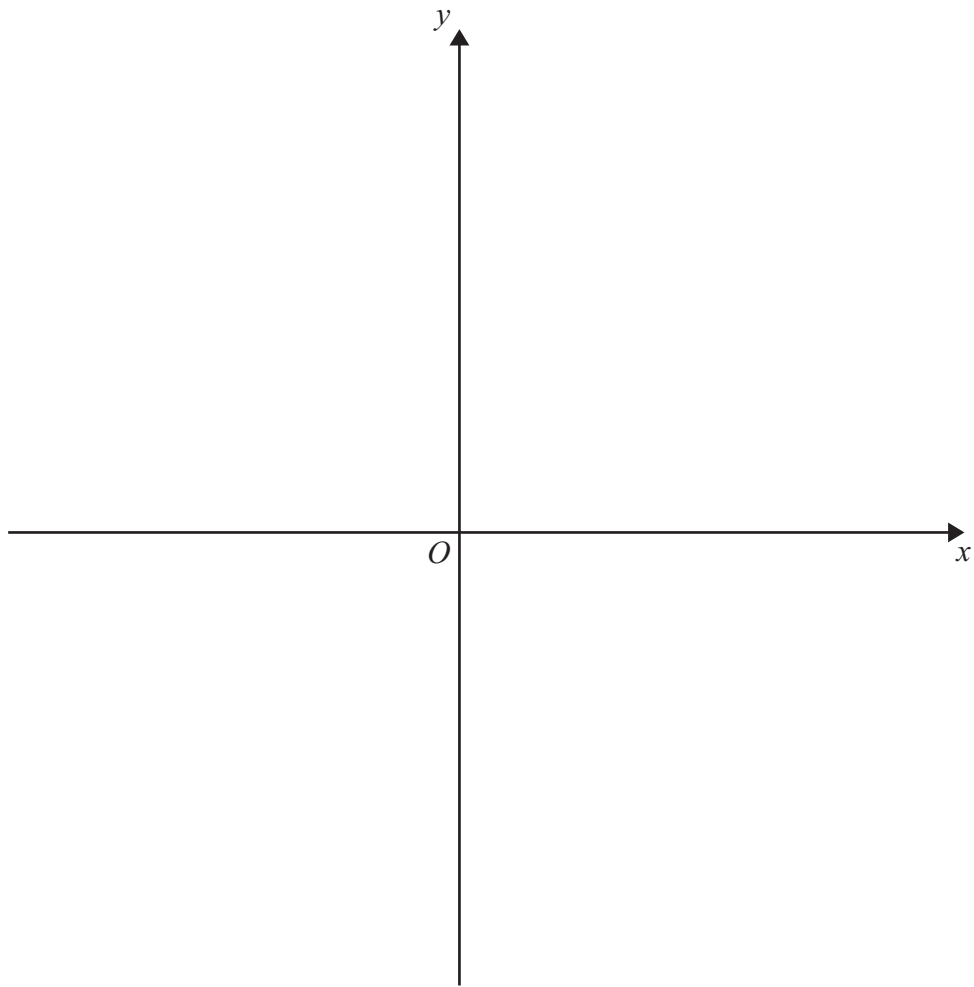
(b) Factorise $6ad^2 - 3a^2d$

.....
(2)

(Total for Question 6 is 4 marks)



7 (a) Sketch the graph of $y = 9 - x^2$



(3)

(b) For $y = 9 - x^2$, explain what happens to the value of y as the value of x becomes very large.

(1)

(Total for Question 7 is 4 marks)



8 $u = \frac{3t + 2}{5}$

$t = 11$

(a) Work out the value of u .

.....
(2)

$u = \frac{3t + 2}{5}$

(b) Make t the subject of the formula.

$t =$
.....
(3)

$D = b^2 - 4ac$

$a = -6, b = 7, c = 2$

(c) Work out the value of D .

.....
(2)

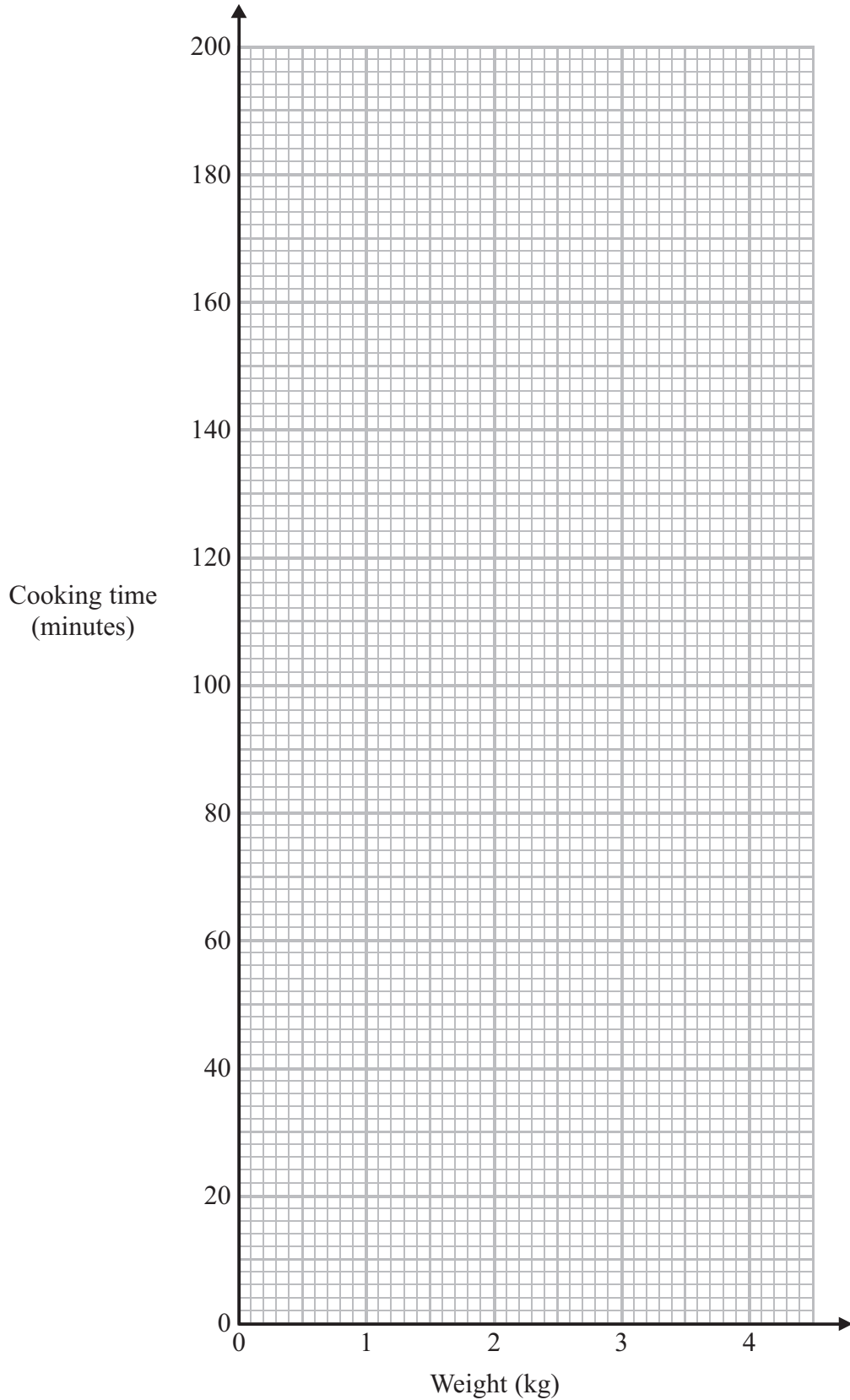
(Total for Question 8 is 7 marks)



9 The time taken to cook a chicken is

40 minutes per kg plus an extra 20 minutes

(a) On the grid, draw a graph to show the cooking times for chickens of any weight up to 4 kg.



(2)



It takes 110 minutes to cook a chicken.

(b) What is the weight of this chicken?

..... kg
(2)

(Total for Question 9 is 4 marks)



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

“multiply the previous term by 2 and subtract 1”

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

.....
(2)

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

(b) Write down the first two terms of this sequence.

.....
(2)

Here are the first five terms of another arithmetic sequence.

3 9 15 21 27

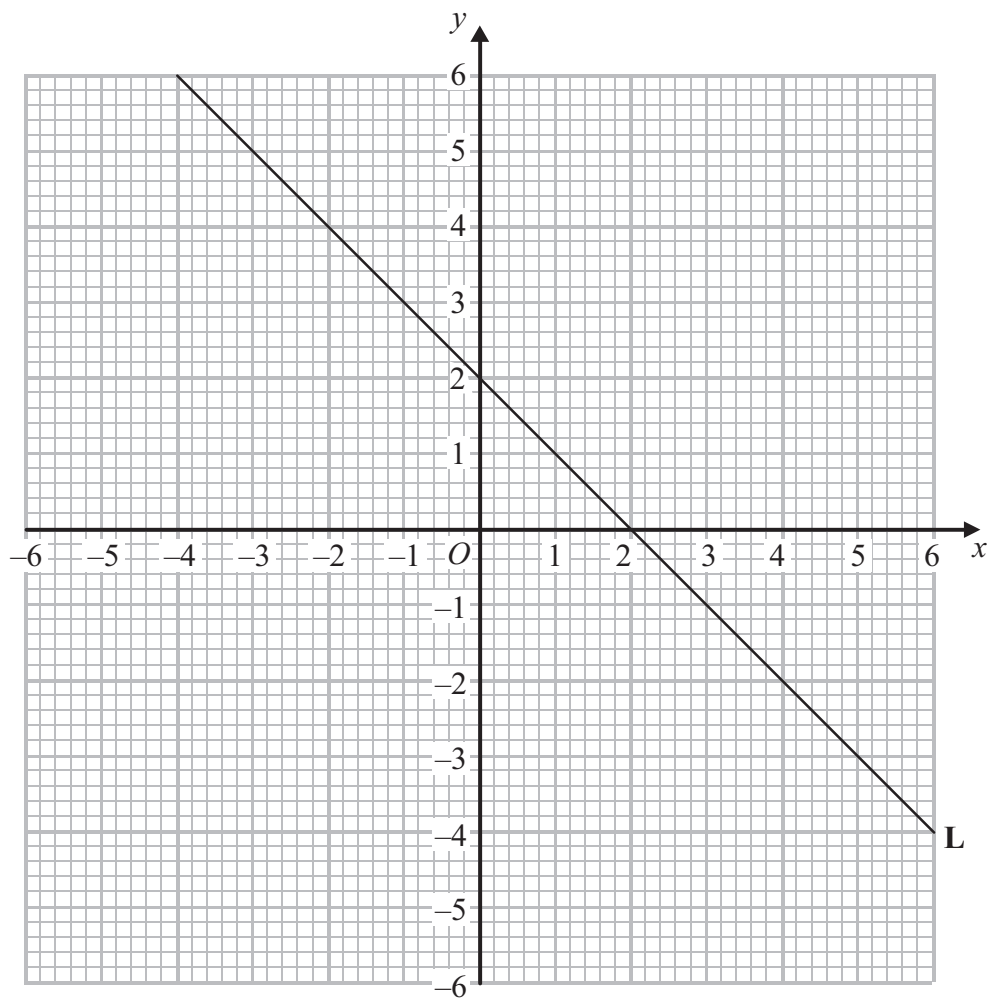
(c) Write down an expression, in terms of n , for the n th term of this sequence.

.....
(2)

(Total for Question 10 is 6 marks)



11 Work out the gradient of line L.



.....
(Total for Question 11 is 2 marks)



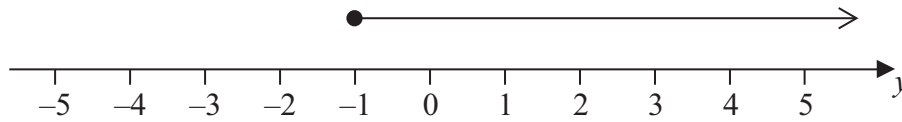
12 $-2 \leq n < 2$

n is an integer.

(a) Write down all the possible values of n .

.....
(2)

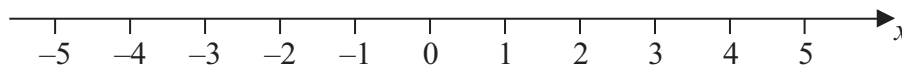
(b) Here is an inequality, in y , shown on a number line.



Write down the inequality.

.....
(2)

(c) On the number line below, show the inequality $-3 < x < 2$



(2)

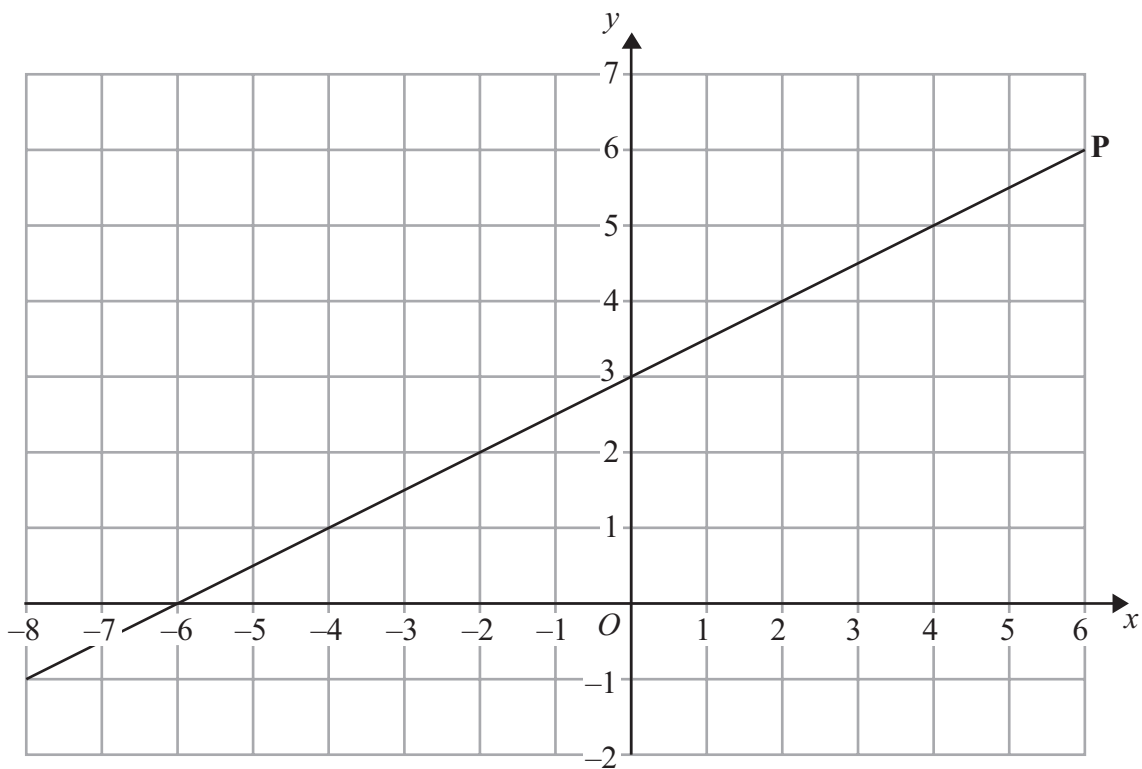
(d) Solve $4x + 9 \geq 2x + 6$

.....
(3)

(Total for Question 12 is 9 marks)



13 Find an equation of the straight line P.

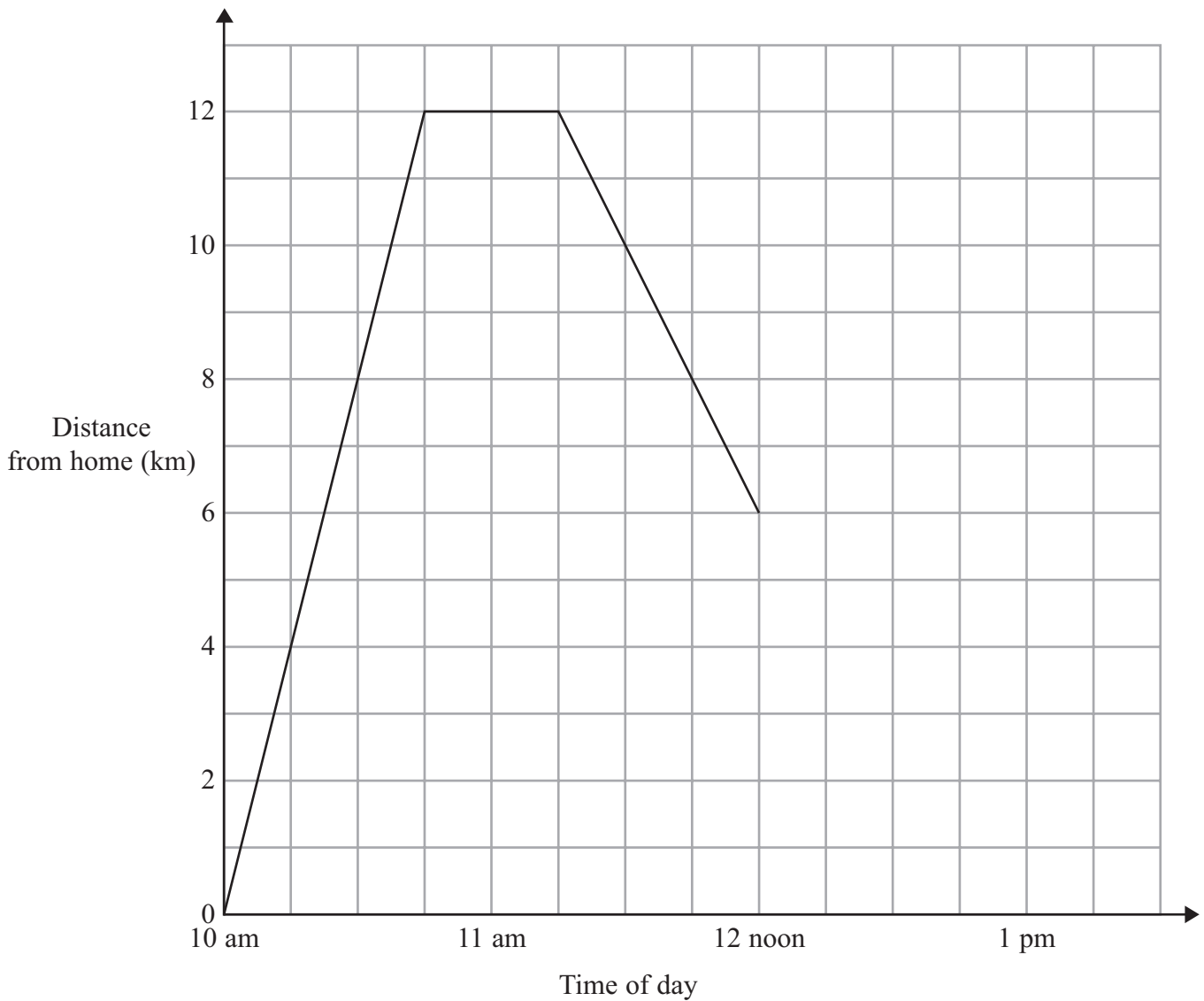


.....
(Total for Question 13 is 2 marks)



14 Jeff left home at 10 am to go for a cycle ride.

Here is the travel graph for part of his journey.



At 12 noon Jeff stopped for 15 minutes to have a drink.

He then cycled home at a steady speed.

Jeff got back home at 1 pm.

(a) Use this information to complete the travel graph.

(2)



(b) Between which times was Jeff's speed greatest?
Explain your answer.

(2)

(Total for Question 14 is 4 marks)

15 Jenny earns p pounds for each hour she works.
She works for m hours on Monday and for t hours on Tuesday.

(a) Write down an expression for the total amount, in pounds, that Jenny earns.

.....
(2)

James has £60 to spend.
He buys n books at £8 each.

(b) Write down an expression for the amount, in pounds, that James has left.

.....
(2)

(Total for Question 15 is 4 marks)

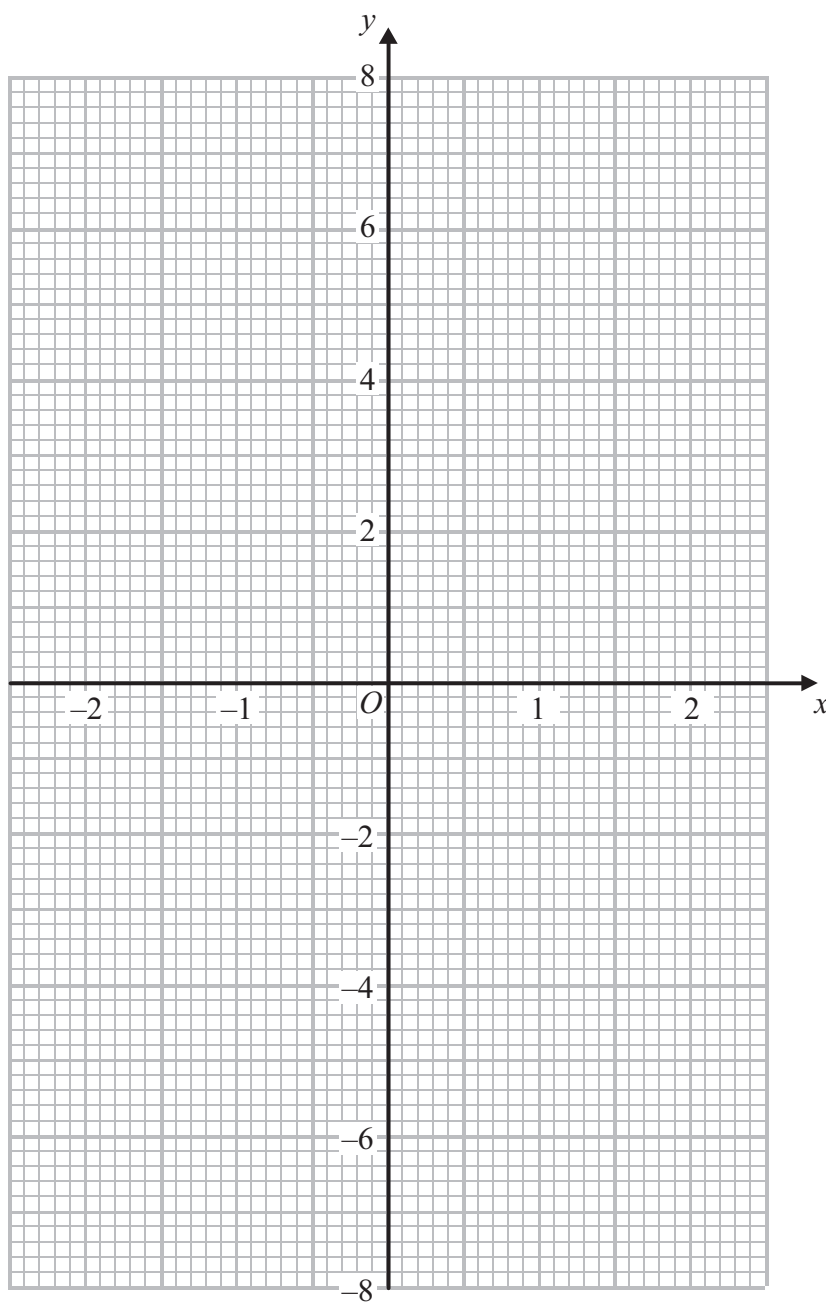


16 (a) Complete the table of values for $y = 2x^2 - 1$

x	-2	-1.5	-1	-0.5	0	0.5	1	1.5	2
y	7	3.5		-0.5				3.5	7

(2)

(b) On the grid, draw the graph of $y = 2x^2 - 1$ for values of x from $x = -2$ to $x = 2$



(2)



(c) Use your graph to find estimates for the solutions of $2x^2 - 1 = 0$

.....
(2)

(Total for Question 16 is 6 marks)

TOTAL FOR PAPER IS 80 MARKS



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