Edexcel
Award in Algebra

Level 2

Practice Paper

Time: 1 hour 30 minutes

You must have:

Ruler graduated in centimetres and millimetres, pen, HB pencil, eraser.

Instructions

- Use **black** ink or ball-point pen.
- Answer **all** questions.
- Answer the questions in the shaded boxes provided.
  – *there may be more space than you need.*
- Write your answer on the answer line where shown.

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.

PEARSON

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all stages of your working.

1 The rule to change a UK shoe size to a European shoe size is

"Multiply the UK shoe size by 1.25 and then add 32"

Dominic's UK shoe size is 8

(a) Use the rule to work out Dominic's European shoe size.

.....

(2)

Philippa's UK shoe size is y.

(b) Write down an expression for Philippa's European shoe size.

.....

(2)

(Total for Question 1 is 4 marks)

2 (a) Simplify $t \times t \times t$

.....

(1)

(b) Simplify $\frac{n^2}{n}$

.....

(1)

(c) Simplify $m^4 \times m^3$

.....

(1)

(d) Simplify $(3y^5)^2$

.....

(1)

(e) Simplify $\frac{6x^5y^3}{2x^2y^2}$

.....

(2)

(Total for Question 2 is 6 marks)

3 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**
$4n + 7$			
$5(x - 3) = 8$			
$A = \pi r^2$			
$6x - 2y$			

(Total for Question 3 is 3 marks)

4 (a) Simplify $5x + 8y + 3x - 4y$

.....

(2)

(b) Factorise $3w - 12$

.....

(1)

(c) Expand $ab(2ab - 3)$

.....

(2)

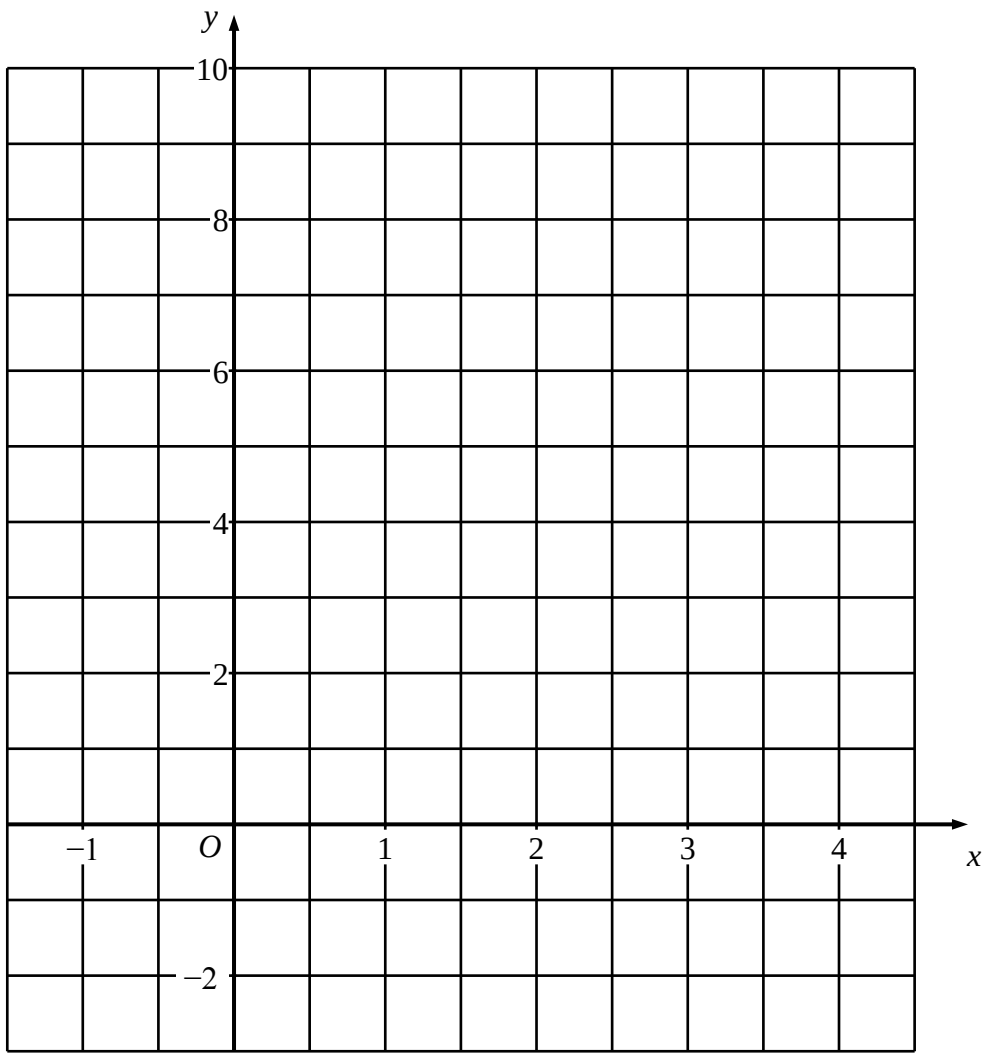
(d) Expand and simplify $2(3x - 1) - 3(x - 1)$

.....

(2)

(Total for Question 4 is 7 marks)

5 On the grid, draw the graph of $y = 6 - 2x$ for values of x from -1 to 4



(Total for Question 5 is 3 marks)

6 (a) Solve $3q + 6 = 15$

.....

(2)

(b) Solve $\frac{t+5}{3} = 4$

.....

(2)

(c) Solve $3 - 2n = 7$

.....

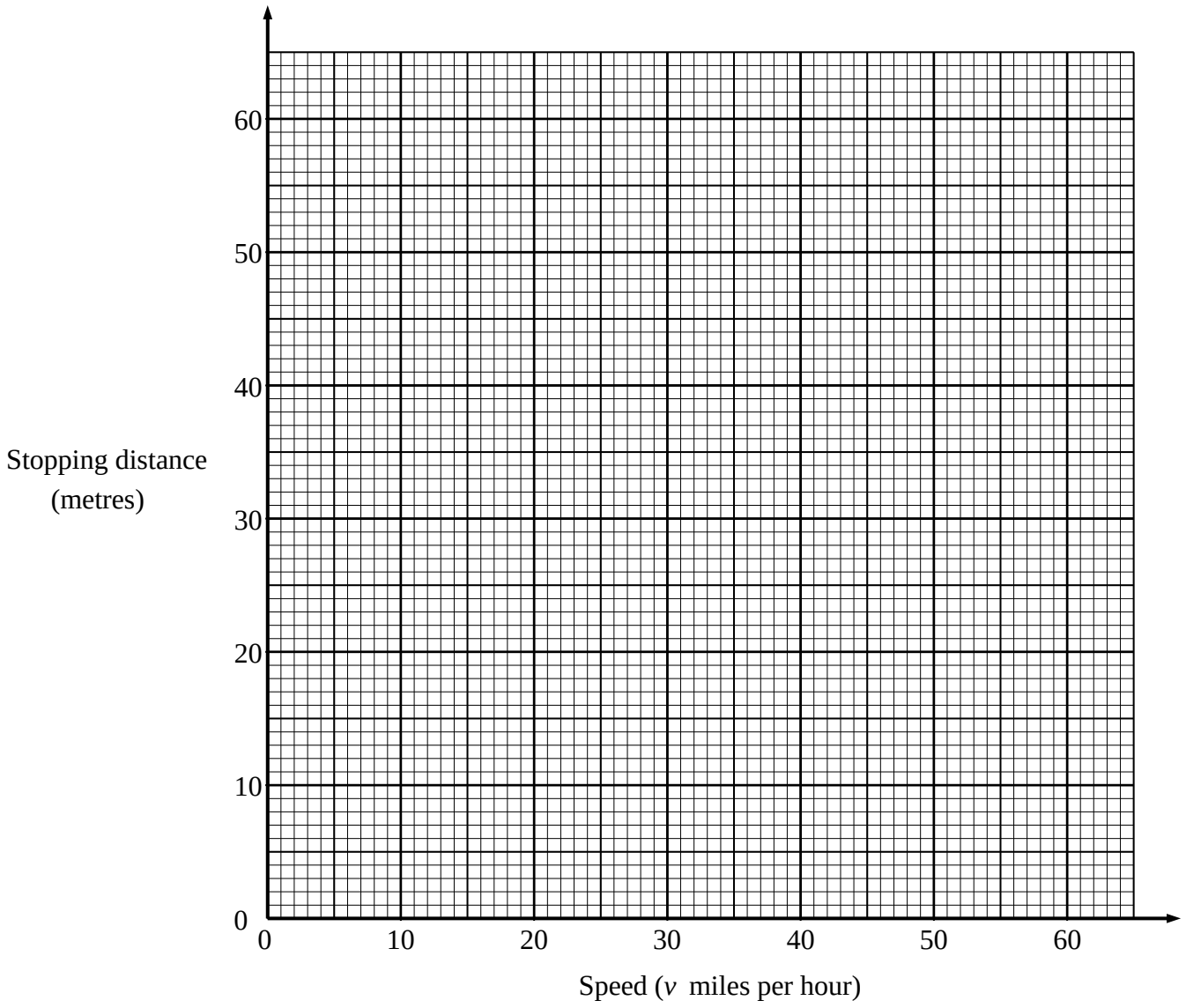
(2)

(Total for Question 6 is 6 marks)

7 The table shows information about the stopping distance, in metres, of a motorbike travelling at v miles per hour.

Speed (v miles per hour)	20	30	40	50	60
Stopping distance (metres)	6	14	25	39	56

(a) On the grid, draw a graph to show the stopping distances of a motorbike for all speeds up to 60 miles per hour.



(2)

(b) Estimate the stopping distance of a motorbike travelling at 55 miles per hour.

..... metres

(1)

(Total for Question 7 is 3 marks)

8 (a) Factorise $p^2 - 2p$

.....

(1)

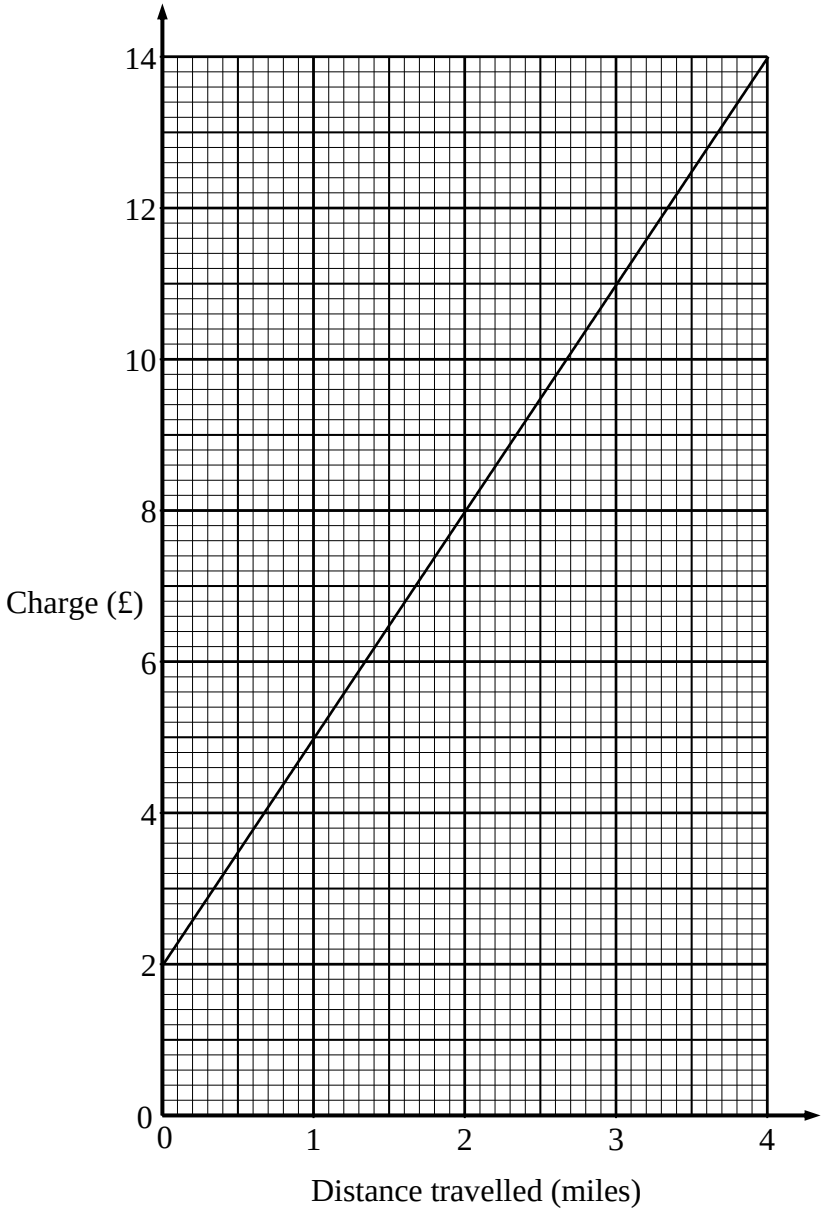
(b) Factorise fully $8qt + 20q^2$

.....

(2)

(Total for Question 8 is 3 marks)

9 The graph shows information about the charges made by a taxi firm for different distances travelled.



(a) Work out the gradient of the graph.

.....

(1)

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

.....

.....

(1)

(Total for Question 9 is 2 marks)

10 To obtain the next term of a sequence use the rule

"add 1 to the previous term and multiply by 5"

The first term of the sequence is 3

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

.....

(2)

The nth term of a different sequence is given by the expression $n^2 - 1$

(b) Find the 12th term of this sequence.

.....

(2)

Here are the first five terms of an arithmetic sequence.

30 26 22 18 14

(c) (i) The first negative term of this sequence is t.
Find the value of t.

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

.....

(4)

(Total for Question 10 is 8 marks)

11 The sum S in degrees of the interior angles of an n-sided polygon is given by the formula

$$S = 180(n - 2)$$

(a) Work out the sum in degrees of the interior angles of a 6-sided polygon.

.....

(2)

(b) Make n the subject of the formula $S = 180(n - 2)$

$n =$ .....

(2)

(Total for Question 11 is 4 marks)

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12 $T = 2w + 7$

(a) $w = -5$

Work out the value of T.

(2)

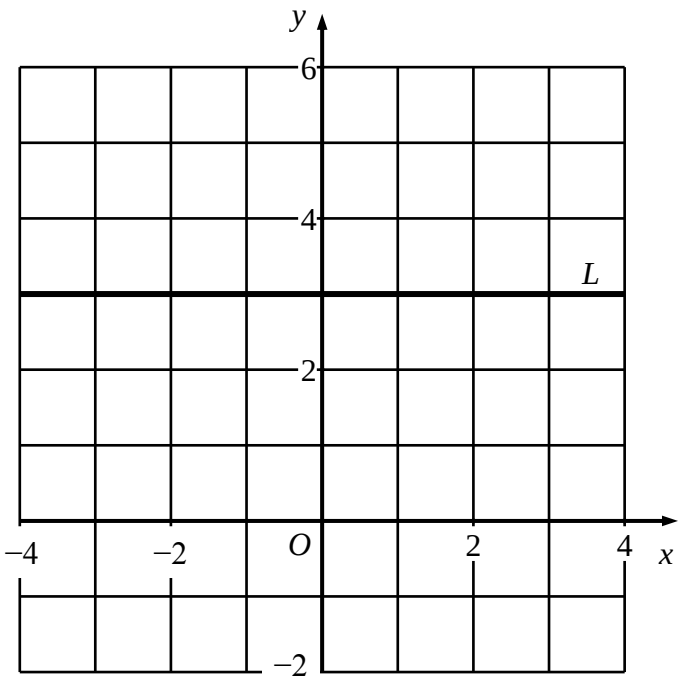
(b) $T = 34$

Work out a the value of w.

(2)

(Total for Question 12 is 4 marks)

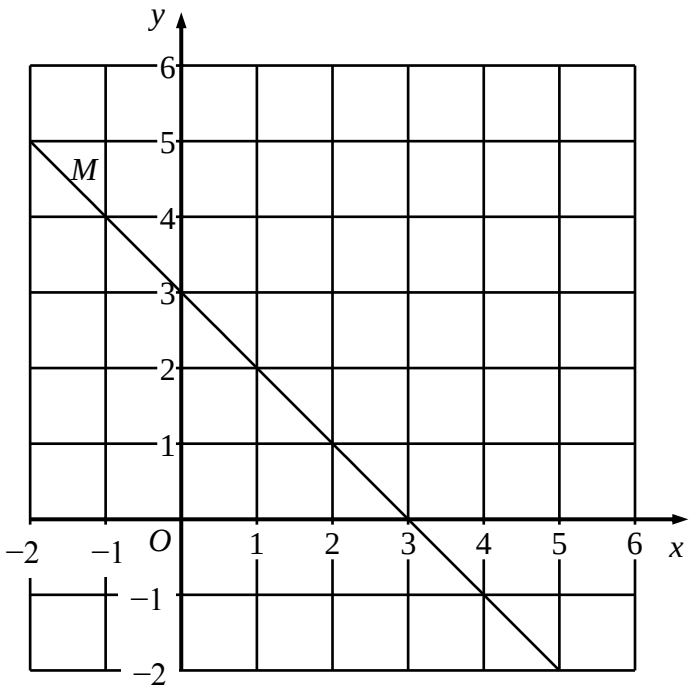
13 (a) Write down the gradient of line L.



.....

(1)

(b) Find an equation of the straight line M.



.....

(2)

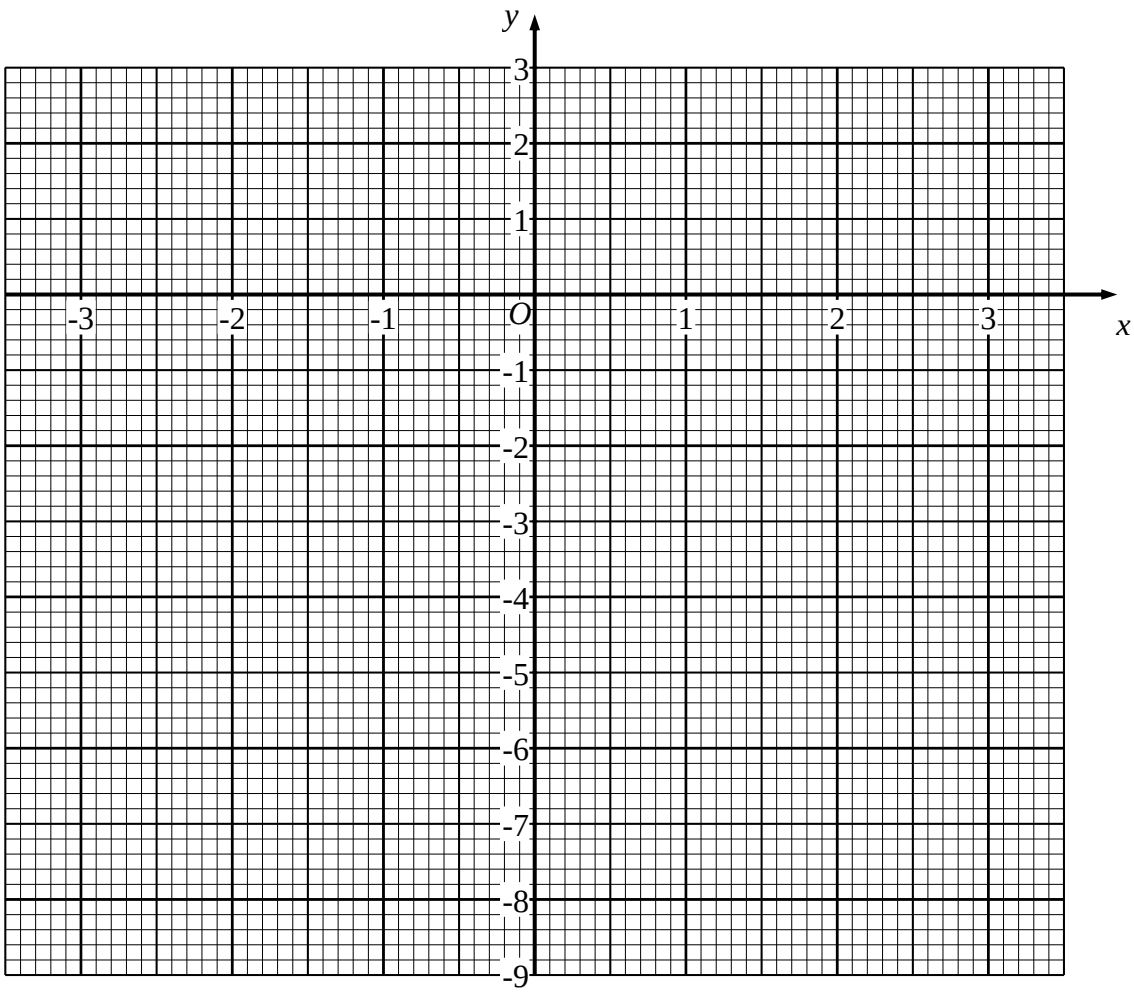
(Total for Question 13 is 3 marks)

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

x	−3	−2	−1	0	1	2	3
y	−7		1	2			

(2)

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



(2)

(c) Use your graph to find estimates for the solutions of $2 - x^2 = -5$

(2)

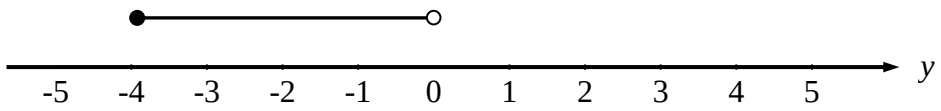
(Total for Question 14 is 6 marks)

15 $-3 \leq p < 1$
p is an integer.

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

(2)

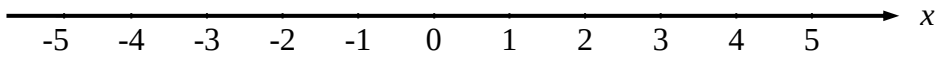
(b) Here is an inequality shown on a number line.



Write down this inequality.

(2)

(c) On the number line below, show the inequality $-2 \leq x \leq 4$



(2)

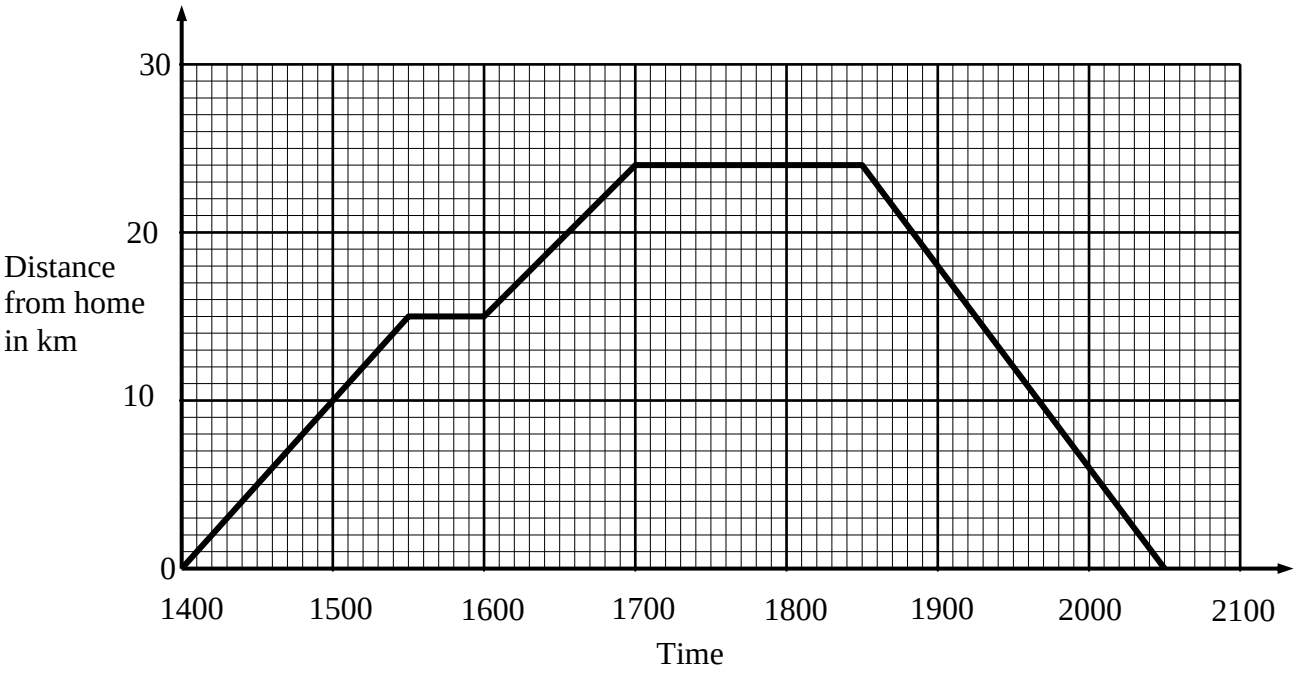
(d) Solve the inequality $-6x > 3$

(2)

(Total for Question 15 is 8 marks)

16 James cycled from his home to visit his grandmother.
He also cycled back home.

The distance-time graph shows his journey.



James had a rest on the way to his grandmother's house.

(a) How far did James cycle before he had a rest?

……km
(1)

(b) For how many hours was James away from his home?

……
(2)

(c) Work out James' speed for his journey from his grandmother's house back to his home.
Give your answer in kilometres per hour.

……
(2)

(Total for Question 16 is 5 marks)

17 The equation of a graph is $y = -(x + 3)^2$

(a) (i) Find the coordinates of the point where the graph of $y = -(x + 3)^2$ crosses the y axis.

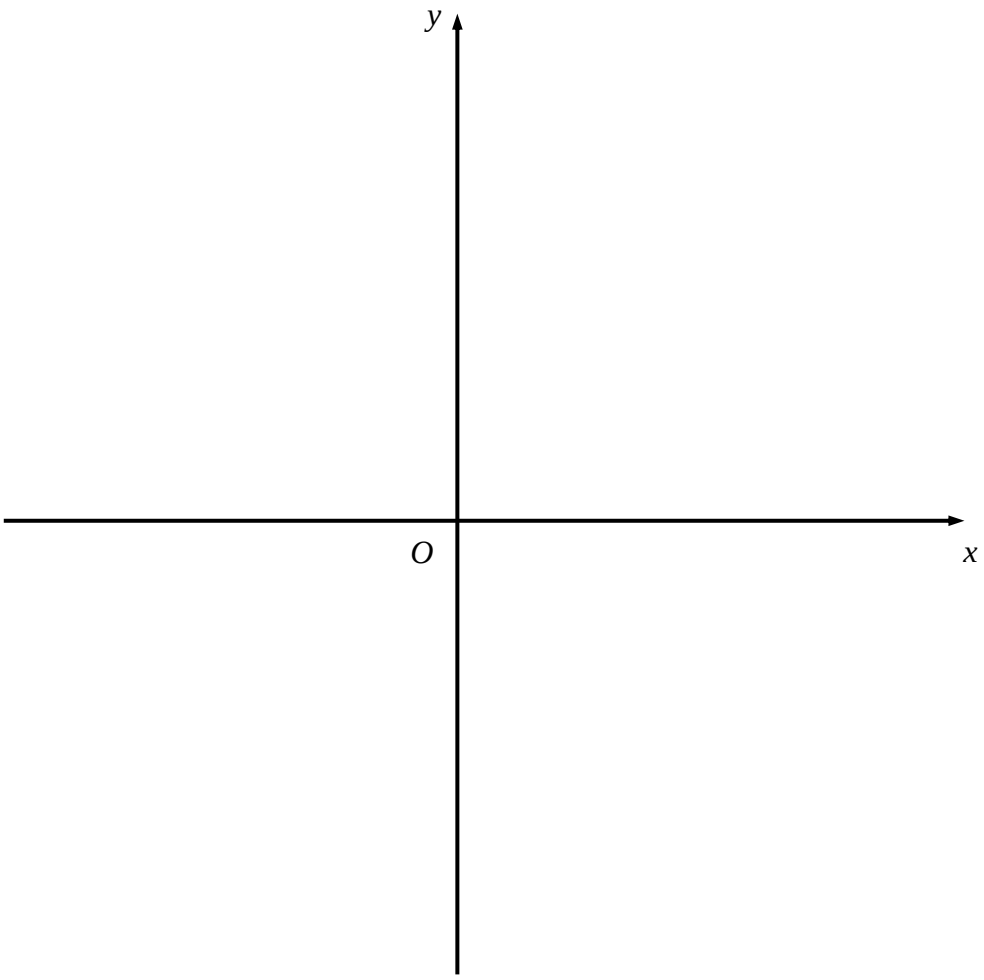
(ii) Find the coordinates of the point where the graph of $y = -(x + 3)^2$ meets the x axis.

(2)

(b) For $y = -(x + 3)^2$, explain what happens to the value of y for large positive and large negative values of x.

(1)

(c) On the axes below, sketch the graph of $y = -(x + 3)^2$



(2)

(Total for Question 17 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS