

1MA1 Higher themed papers: Co-ordinate geometry - Linear graphs

Write your name here	
Surname	Other names
Centre Number	Candidate Number
Pearson Edexcel Level 1/Level 2 GCSE (9–1)	
Mathematics Linear graphs	
	Paper Reference 1MA1
You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.	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.*
- You must **show all your working.**
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

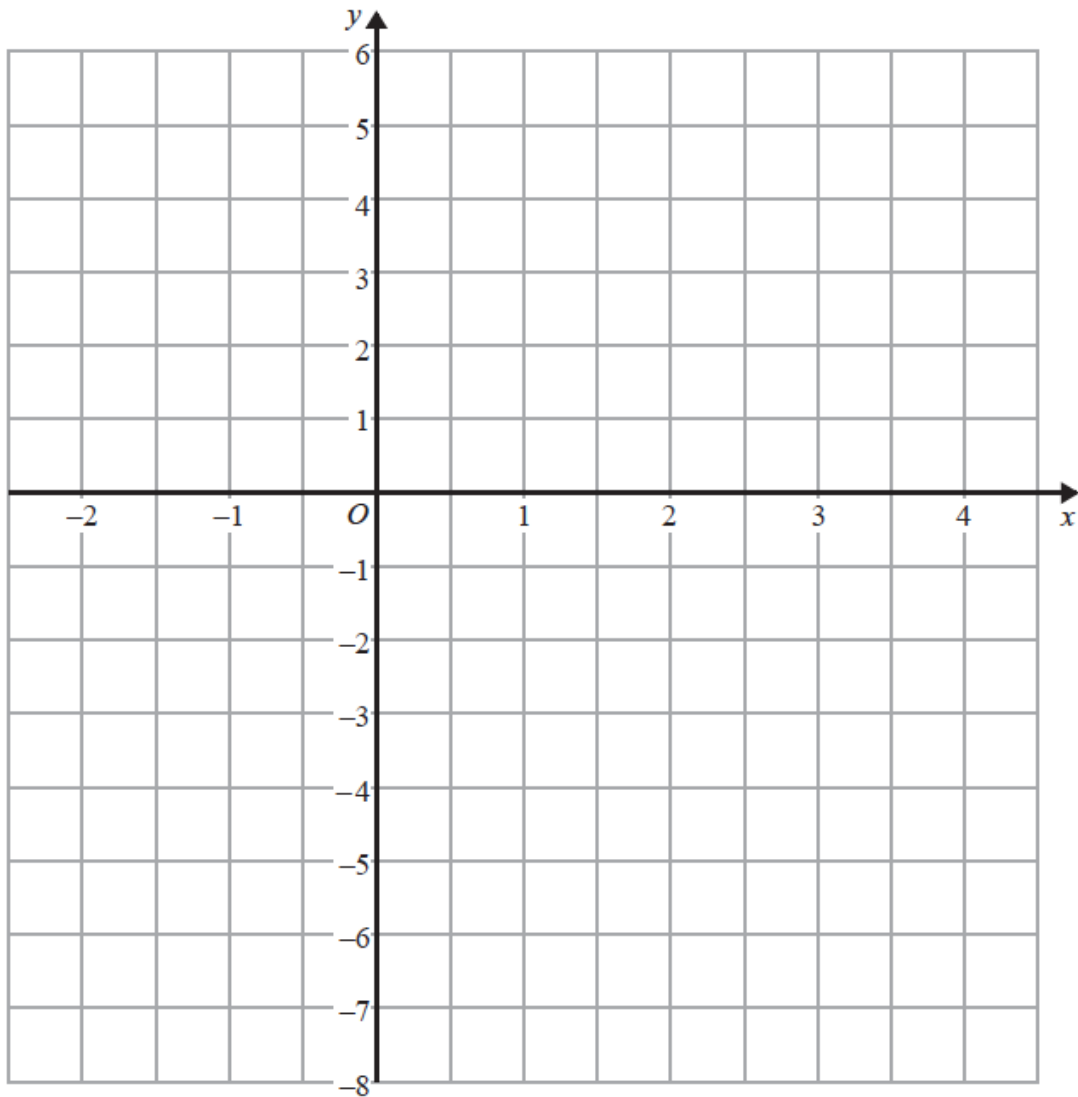
- The total mark for this paper is **66**. There are **19** questions.
- Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2017–November 2019 examinations.
- The marks for **each** question are shown in brackets – *use this as a guide as to how 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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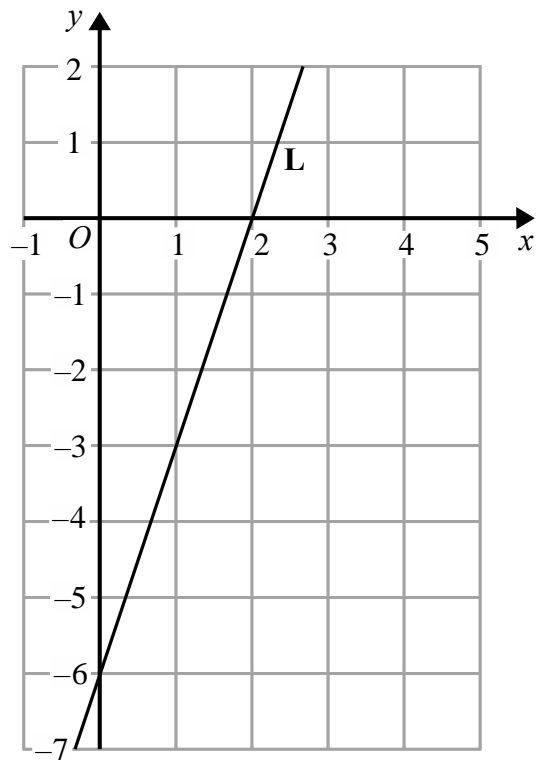
- 1 On the grid below, draw the graph of $y = 2x - 3$ for values of x from -2 to 4



(Total for Question 1 is 3 marks)

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2 The line **L** is shown on the grid.

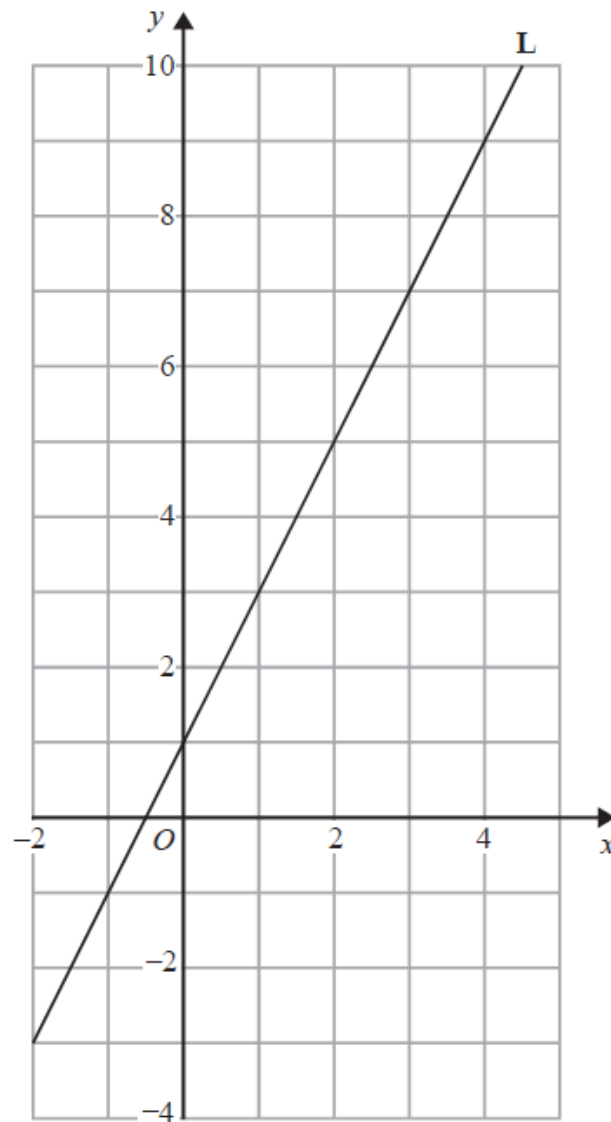


Find an equation for **L**.

.....
(Total for Question 2 is 3 marks)

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3 Line **L** is drawn on the grid below.

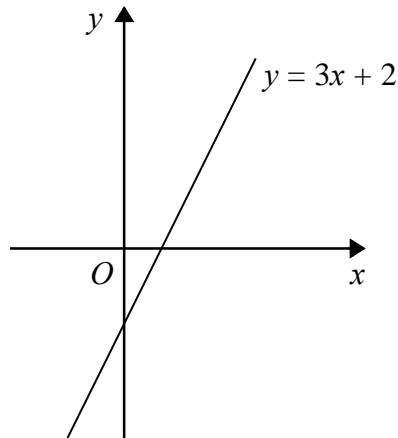


Find an equation for the straight line **L**.
Give your answer in the form $y = mx + c$.

.....
(Total for Question 3 is 3 marks)

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- 4 Shona has to draw the line with equation $y = 3x + 2$
Here is her line.



(c) Explain why Shona's line **cannot** be correct.

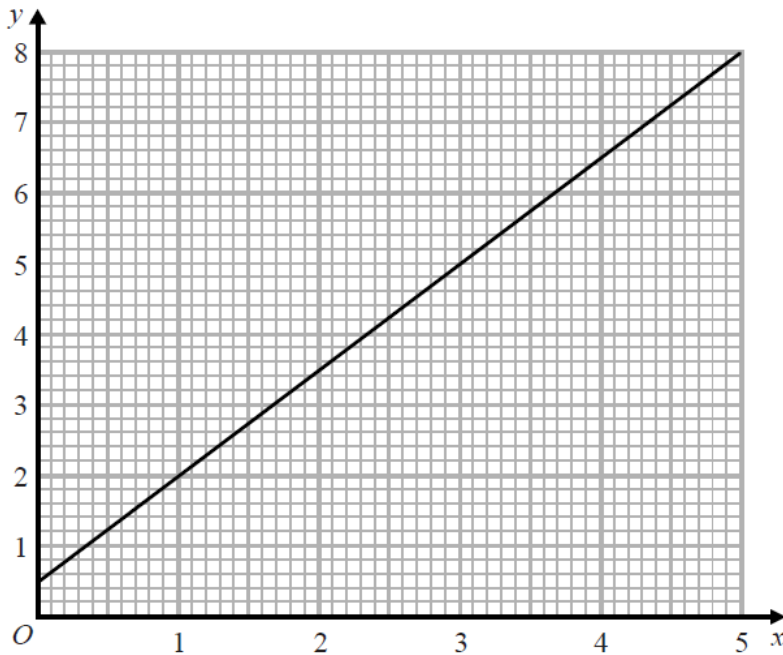
.....
.....

(1)

(Total for Question 4 is 3 marks)



5



Phone calls cost £ y for x minutes.

The graph gives the values of y for values of x from 0 to 5.

(a) (i) Give an interpretation of the intercept of the graph on the y -axis.

.....

(ii) Give an interpretation of the gradient of the graph.

.....

(2)

(b) Find the equation of the straight line in the form $y = m x + c$

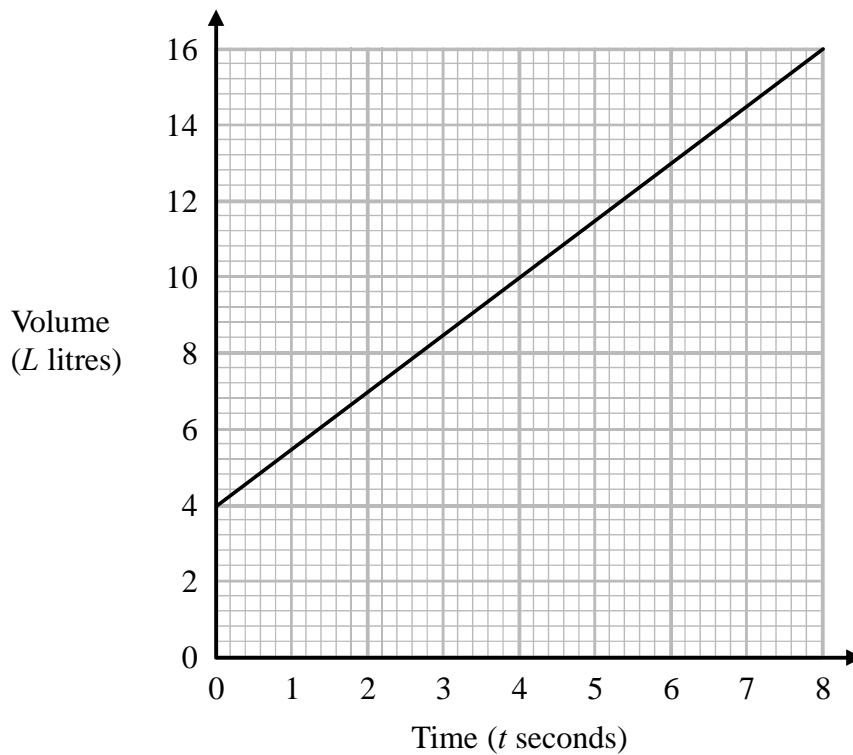
.....

(3)

(Total for Question 5 is 5 marks)

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6 The graph shows the volume of liquid (L litres) in a container at time t seconds.



(a) Find the gradient of the graph.

.....
(2)

(b) Explain what this gradient represents.

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

The graph intersects the volume axis at $L = 4$

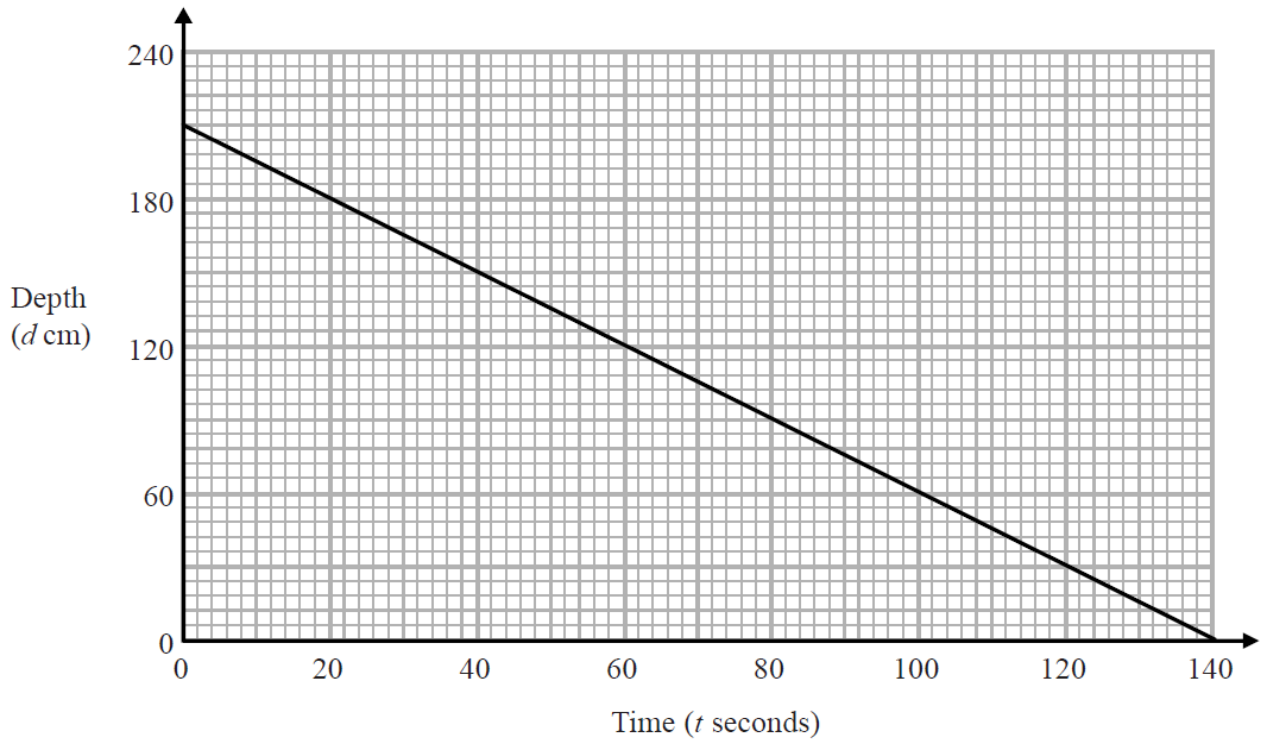
(c) Explain what this intercept represents.

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

(Total for Question 6 is 4 marks)

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7 The graph shows the depth, d cm, of water in a tank after t seconds.



(a) Find the gradient of this graph.

.....
(2)

(b) Explain what this gradient represents.

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

(Total for Question 7 is 3 marks)

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- 8** The equation of the line L_1 is $y = 3x - 2$
The equation of the line L_2 is $3y - 9x + 5 = 0$
Show that these two lines are parallel.

(Total for Question 8 is 2 marks)

- 9** A is the point with coordinates $(2, 10)$
 B is the point with coordinates $(5, d)$

The gradient of the line AB is 4

Work out the value of d .

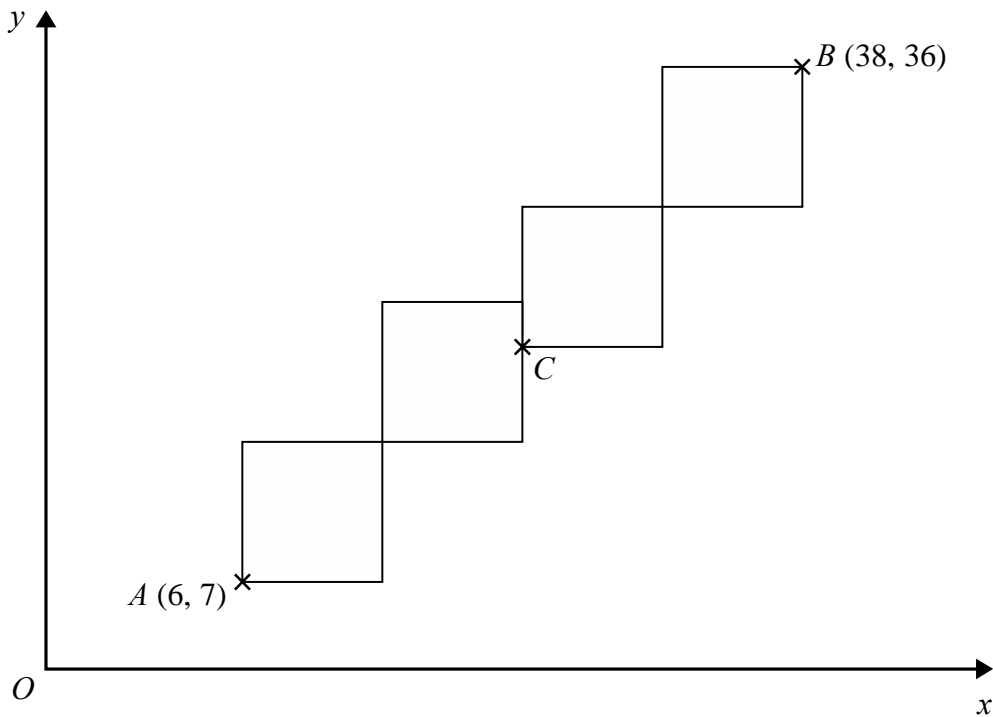
$d = \dots\dots\dots$

(Total for Question 9 is 3 marks)

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- 10 A pattern is made from four identical squares.
The sides of the squares are parallel to the axes.



Point *A* has coordinates (6, 7)
Point *B* has coordinates (38, 36)
Point *C* is marked on the diagram.

Work out the coordinates of *C*.

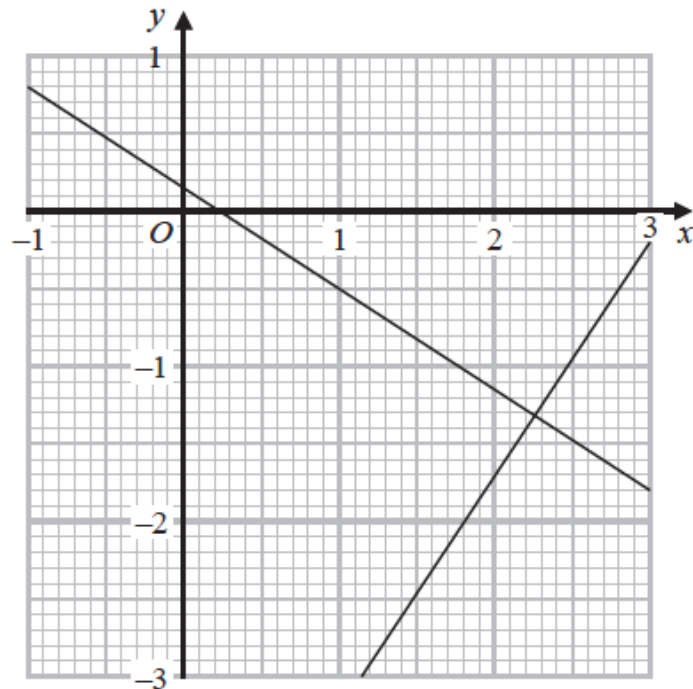
(.....,))

(Total for Question 10 is 5 marks)

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- 11** The graphs with equations $3y + 2x = \frac{1}{2}$ and $2y - 3x = -\frac{113}{12}$ have been drawn on the grid below.



Using the graphs, find estimates of the solutions of the simultaneous equations

$$3y + 2x = \frac{1}{2}$$

$$2y - 3x = -\frac{113}{12}$$

$x = \dots\dots\dots$

$y = \dots\dots\dots$

(Total for Question 11 is 2 marks)

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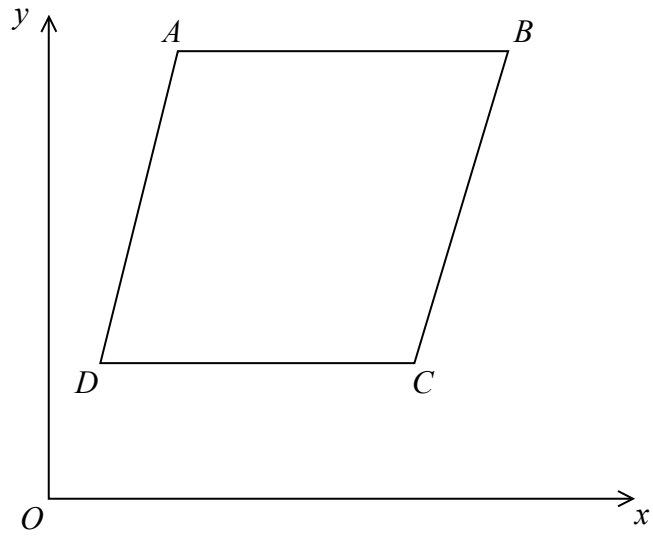
- 12** The straight line **L** has the equation $3y = 4x + 7$
The point *A* has coordinates (3, -5)

Find an equation of the straight line that is perpendicular to **L** and passes through *A*.

.....
(Total for Question 12 is 3 marks)



13



$ABCD$ is a rhombus.

The coordinates of A are $(5,11)$

The equation of the diagonal DB is $y = \frac{1}{2}x + 6$

Find an equation of the diagonal AC .

.....
(Total for Question 13 is 4 marks)

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- 14** A is the point with coordinates $(5, 9)$
 B is the point with coordinates $(d, 15)$
The gradient of the line AB is 3
Work out the value of d .

.....
(Total for Question 14 is 3 marks)

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15

The point P has coordinates $(3, 4)$

The point Q has coordinates (a, b)

A line perpendicular to PQ is given by the equation $3x + 2y = 7$

Find an expression for b in terms of a .

.....
(Total for Question 15 is 5 marks)

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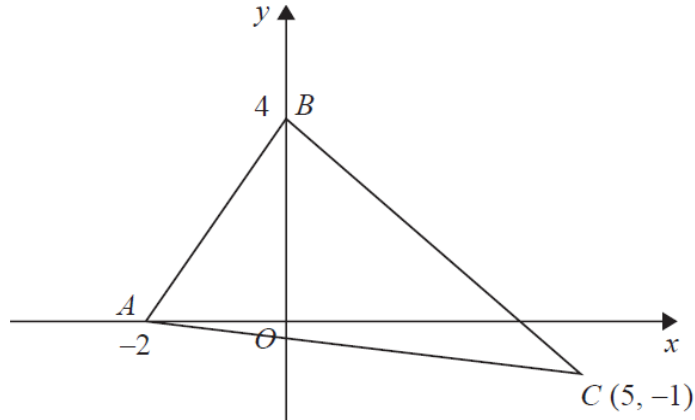
- 16** The straight line L_1 passes through the points with coordinates (4, 6) and (12, 2)
The straight line L_2 passes through the origin and has gradient -3
The lines L_1 and L_2 intersect at point P .
Find the coordinates of P .

(..... ,)

(Total for Question 16 is 4 marks)



17

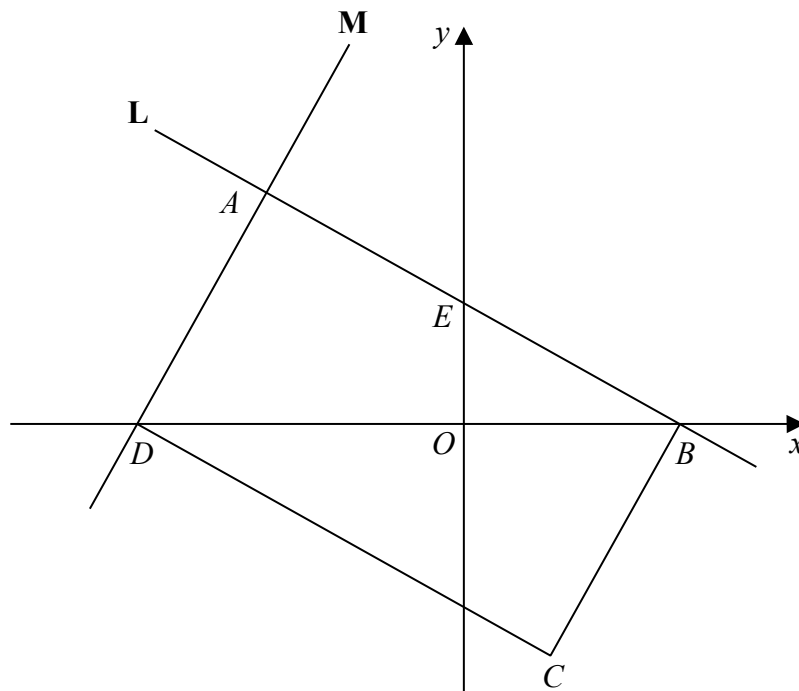


Find an equation of the line that passes through C and is perpendicular to AB .

.....
(Total for Question 17 is 4 marks)



18



$ABCD$ is a rectangle.

A , E and B are points on the straight line L with equation $x + 2y = 12$

A and D are points on the straight line M .

$$AE = EB$$

Find an equation for M .

.....
(Total for Question 18 is 4 marks)

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- 19** P has coordinates $(-9, 7)$
 Q has coordinates $(11, 12)$

M is the point on the line segment PQ such that $PM : MQ = 2 : 3$

Line L is perpendicular to the line segment PQ .

L passes through M .

Find an equation of L .

.....
(Total for Question 1 is 5 marks)

TOTAL MARKS FOR PAPER: 66