

- 1** The equation of the line  $L_1$  is  $y = 2x + 3$   
The equation of the line  $L_2$  is  $5y - 10x + 4 = 0$

Show that these two lines are parallel.

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**(Total for Question 1 is 2 marks)**

2 Here are the equations of two straight lines.

$$y = \frac{1}{2}x - 6 \qquad 6y = 3x + 7$$

Oscar says that these lines are parallel.

Is Oscar correct?

You must give a reason for your answer.

.....

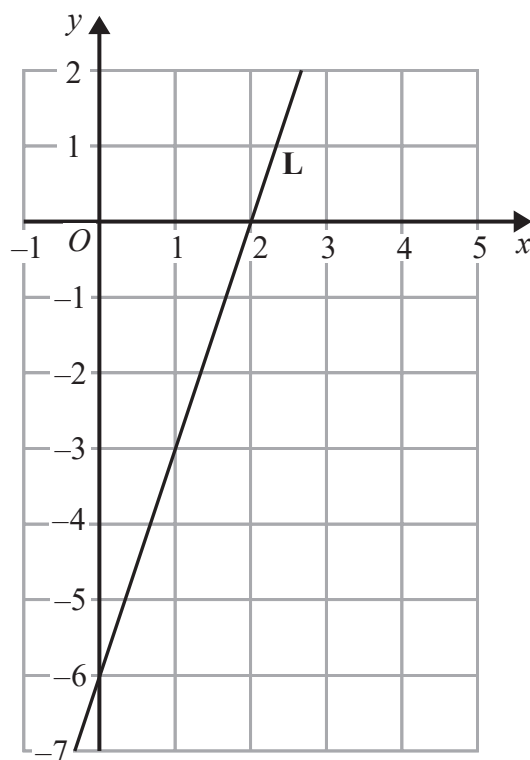
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.....

**(Total for Question 2 is 2 marks)**

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



Find an equation for **L**.

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

- 4 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.

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**(Total for Question 4 is 2 marks)**

- 5 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 5 is 3 marks)**

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- 6 The straight line  $L_1$  has equation  $y = 3x - 4$   
The straight line  $L_2$  is perpendicular to  $L_1$  and passes through the point  $(9, 5)$   
Find an equation of line  $L_2$

.....  
**(Total for Question 6 is 3 marks)**

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- 7  $A$  is the point with coordinates  $(5, 9)$   
 $B$  is the point with coordinates  $(d, 15)$

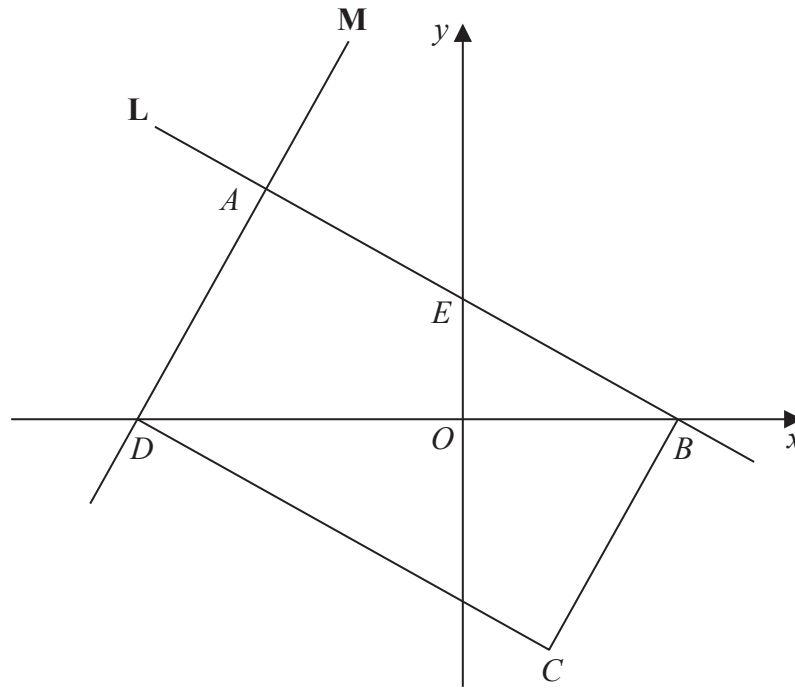
The gradient of the line  $AB$  is 3

Work out the value of  $d$ .

.....  
**(Total for Question 7 is 3 marks)**

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8



$ABCD$  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 8 is 4 marks)



9 A triangle has vertices  $P$ ,  $Q$  and  $R$ .

The coordinates of  $P$  are  $(-3, -6)$

The coordinates of  $Q$  are  $(1, 4)$

The coordinates of  $R$  are  $(5, -2)$

$M$  is the midpoint of  $PQ$ .

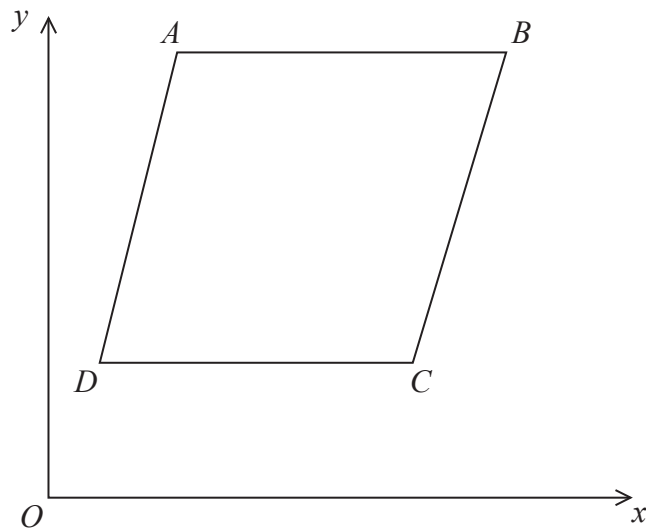
$N$  is the midpoint of  $QR$ .

Prove that  $MN$  is parallel to  $PR$ .

You must show each stage of your working.

**(Total for Question 9 is 4 marks)**

10



$ABCD$  is a rhombus.

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

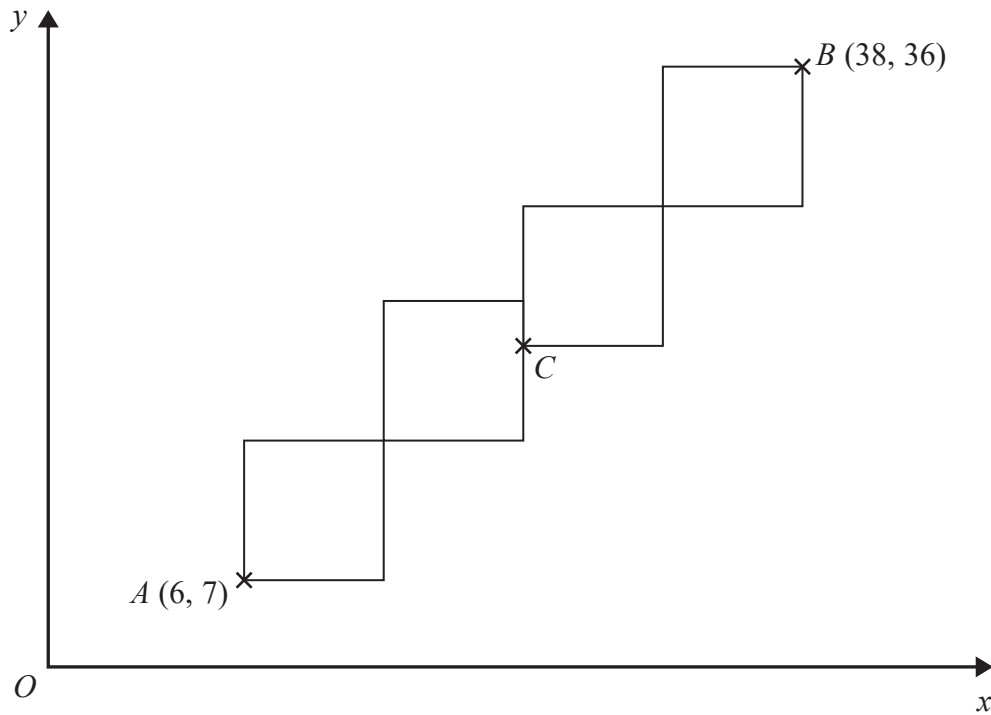
The equation of the diagonal  $DB$  is  $y = \frac{1}{2}x + 6$

Find an equation of the diagonal  $AC$ .

.....  
(Total for Question 10 is 4 marks)

11 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 11 is 5 marks)

- 12** The point  $P$  has coordinates  $(3, 4)$   
The point  $Q$  has coordinates  $(a, b)$

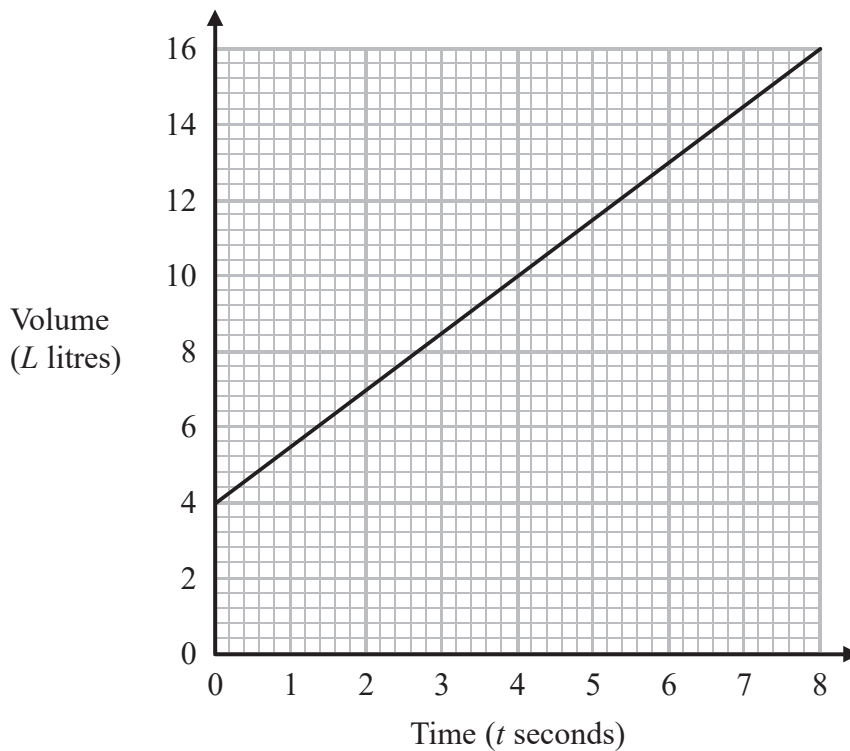
A line perpendicular to  $PQ$  is given by the equation  $3x + 2y = 7$

Find an expression for  $b$  in terms of  $a$ .

.....  
**(Total for Question 12 is 5 marks)**

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13 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)

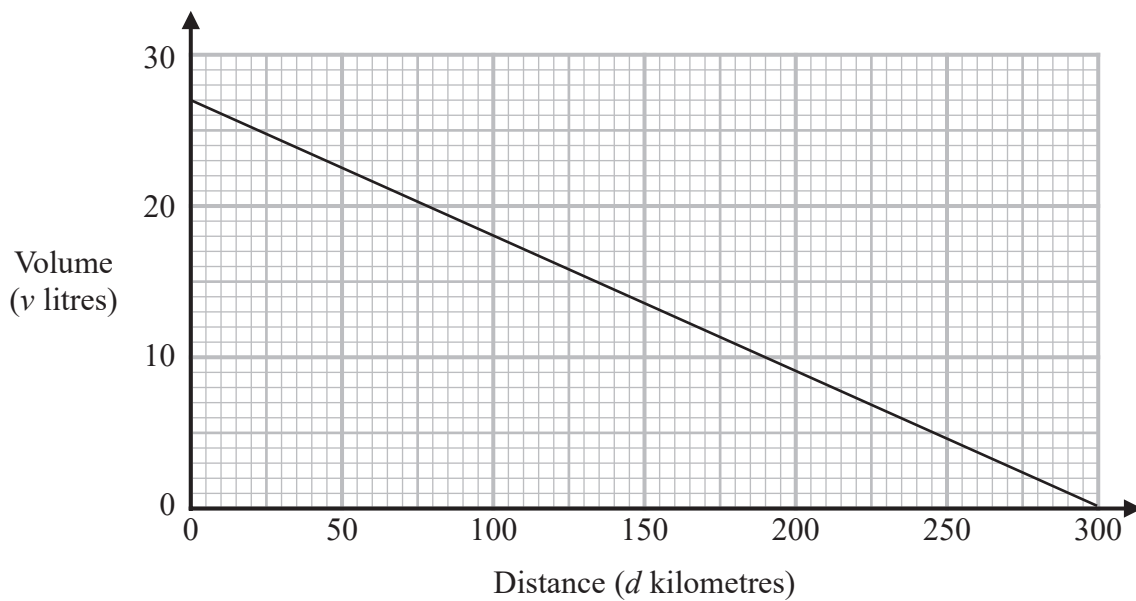
The graph intersects the volume axis at  $L = 4$

(c) Explain what this intercept represents.

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

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

- 14 The graph gives information about the volume,  $v$  litres, of petrol in the tank of Jim's car after it has travelled a distance of  $d$  kilometres.



- (a) Find the gradient of the graph.

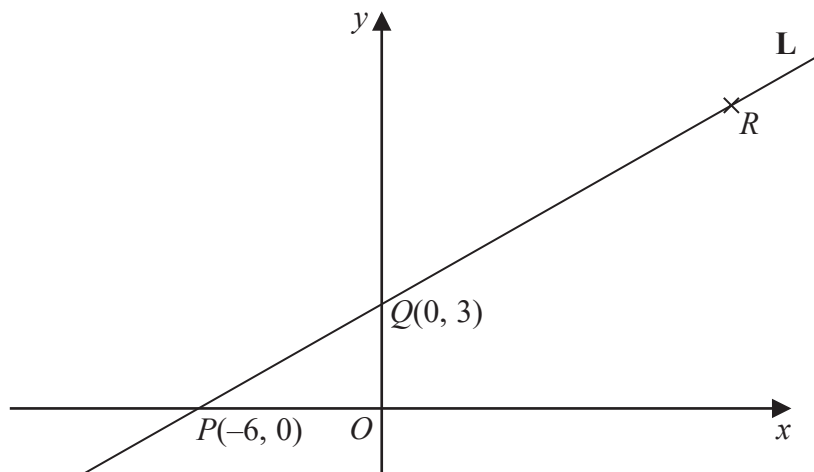
.....  
(2)

- (b) Interpret what the gradient of the graph represents.

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

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

15 Here is a sketch of the line **L**.



The points  $P(-6, 0)$  and  $Q(0, 3)$  are points on the line **L**.

The point  $R$  is such that  $PQR$  is a straight line and  $PQ:QR = 2:3$

(a) Find the coordinates of  $R$ .

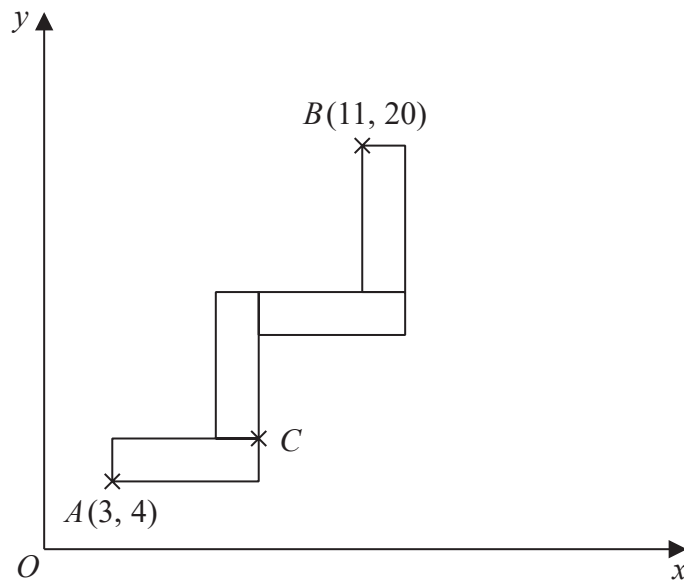
(....., .....)  
(2)

(b) Find an equation of the line that is perpendicular to **L** and passes through  $Q$ .

.....  
(3)

(Total for Question 15 is 5 marks)

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



Point  $A$  has coordinates  $(3, 4)$   
Point  $B$  has coordinates  $(11, 20)$   
Point  $C$  is marked on the diagram.

Work out the coordinates of  $C$ .  
You must show all your working.

(....., .....) )

(Total for Question 16 is 5 marks)



- 17** 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  $P$ .

(..... , .....)

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

**18** The straight line **L** has equation  $3x + 2y = 17$

The point *A* has coordinates (0, 2)

The straight line **M** is perpendicular to **L** and passes through *A*.

Line **L** crosses the *y*-axis at the point *B*.

Lines **L** and **M** intersect at the point *C*.

Work out the area of triangle *ABC*.

You must show all your working.

.....  
**(Total for Question 18 is 5 marks)**

**19** The points  $L$ ,  $M$  and  $N$  are such that  $LMN$  is a straight line.

The coordinates of  $L$  are  $(-3, 1)$

The coordinates of  $M$  are  $(4, 9)$

Given that  $LM : MN = 2 : 3$ ,

find the coordinates of  $N$ .

(..... , .....)

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**(Total for Question 19 is 4 marks)**