Linear Graphs GCSE Questions

Q1. $y = 5x - 4$ is the equation of a straight line.

(a) Write down the gradient of the line $y = 5x - 4$

Answer .....

(1)

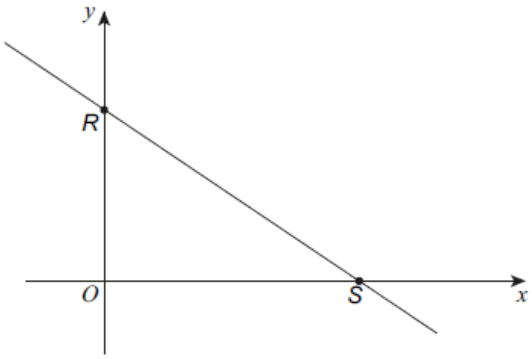
(b) Write down the coordinates of the y-intercept of the line $y = 5x - 4$

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

(1)
(Total 2 marks)

Q2.

A sketch of $2x + 3y = 12$ is shown.



(a) Work out the coordinates of R.

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

(1)

(b) Work out the coordinates of S.

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

(2)
(Total 3 marks)

Q3.

(a) Write down the equation of a straight line that is parallel to $y = 5x + 6$

.....

(1)

(b) Find an equation of the line that is perpendicular to the line $y = 5x + 6$ and passes through the point (–2, 5).

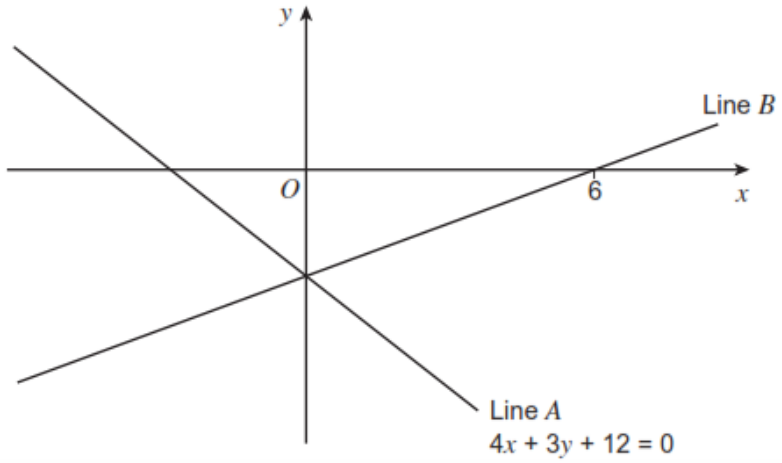
.....

(3)
(Total 4 marks)

Q4. Lines, A and B, intersect on the y-axis.

Line B intersects the x-axis at the point (6, 0).

The equation of line A is $4x + 3y + 12 = 0$



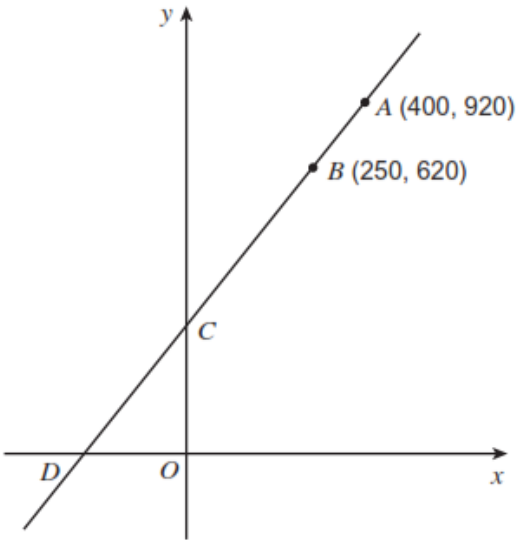
Work out the equation of line B.

Answer .....

(Total 4 marks)

Q5. The diagram shows a line $ABCD$.
A is the point (400, 920).
B is the point (250, 620).
The line cuts the y-axis at C and the x-axis at D.

Not drawn accurately



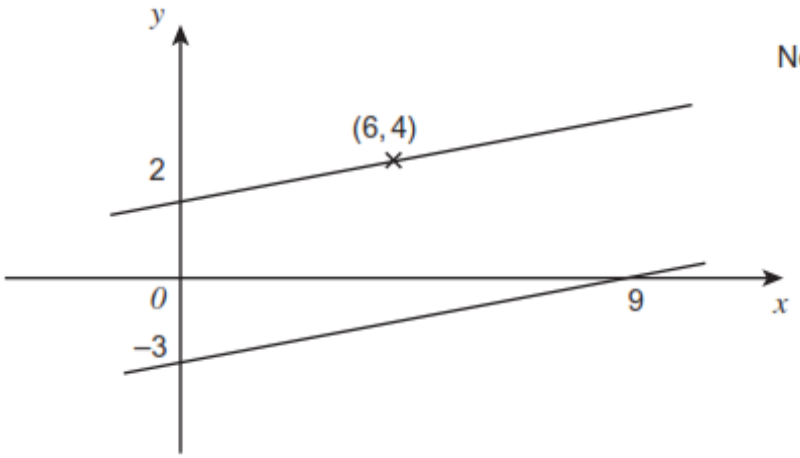
Work out the coordinates of C and D.

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

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

(Total 4 marks)

Q6. Two straight lines are shown.



Not drawn accurately

Prove that the lines never meet.

(Total 3 marks)

Q7.

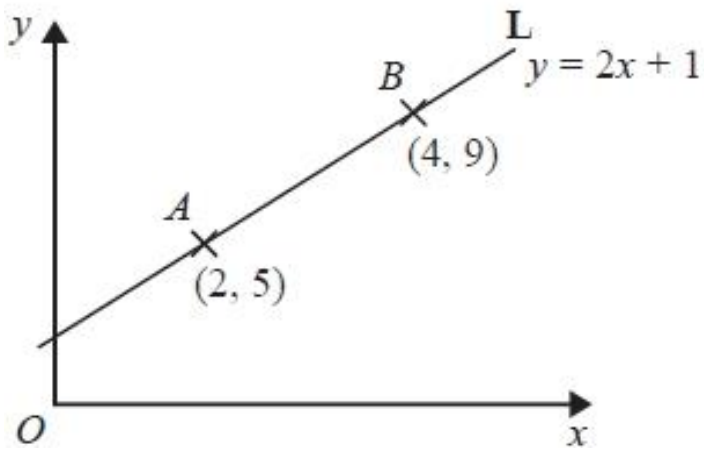


Diagram **NOT** accurately drawn

The point *A* has coordinates (2, 5).
The point *B* has coordinates (4, 9).

The line **L** passes through the points *A* and *B*.
The equation of line **L** is $y = 2x + 1$

M is the midpoint of the line segment *AB*.

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

(Total 4 marks)

***Q8.** *A* is the point with coordinates (1, 3)
B is the point with coordinates (4, −1)
The straight line *L* goes through both *A* and *B*.

Is the line with equation $2y = 3x - 4$ perpendicular to line *L*?
You must show how you got your answer.

(Total 4 marks)

Q9.

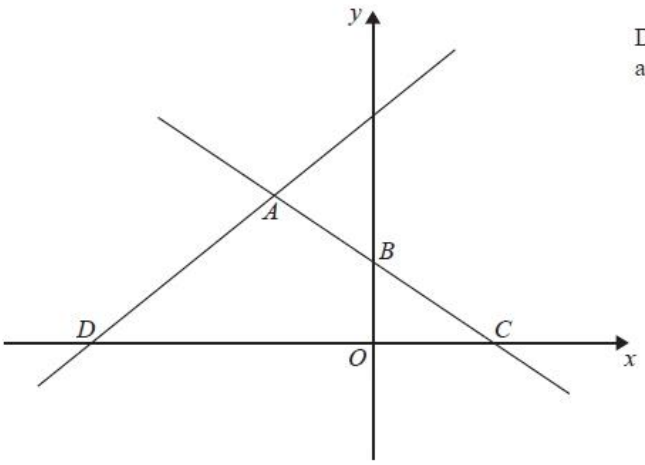


Diagram **NOT** accurately drawn

In the diagram, *ABC* is the line with equation $y = -\frac{1}{2}x + 5$

AB = *BC*
D is the point with coordinates (−13, 0)

Find an equation of the line through *A* and *D*.

(Total 5 marks)

Answers

M1.(a) 5

B1

(b) (0, −4)

B1

[2]

M2.

(a) (0, 4)

B1

(b) (6, 0)

B2ft

[3]

M3.

Question	Working	Answer	Mark	Notes
(a)		$y = 5x + c$	1	B1 for $y = 5x + c$ oe $c \neq 6$
(b)	gradient = $-\frac{1}{m} = -\frac{1}{5}$ $y = -\frac{1}{5} + c$ $x = -2$, $y = 5$ $5 = \frac{2}{5} + c$ $c = 5 - \frac{2}{5} = 4\frac{3}{5}$ $y = -\frac{1}{5}x + 4\frac{3}{5}$	$y = -\frac{1}{5}x + 4\frac{3}{5}$	3	M1 recognition that gradient = $-\frac{1}{m} = -\frac{1}{5}$ oe M1 substitution of $x = -2$, $y = 5$ in $y = mx + c$ where $m = -\frac{1}{5}$, $\frac{1}{5}$ or -5 A1 $y = -\frac{1}{5}x + 4\frac{3}{5}$ oe

M4. $3y + 12 = 0$

M1

$y = -4$

A1

Gradient = $\frac{4}{6}\left(=\frac{2}{3}\right)$

M1

$y = \frac{2}{3}x - 4$ *oe*

A1 ft

[4]

M5. Gradient = 2 or $y = 2x + c$

M1

Substituting $x = 250$, $y = 620$ or $x = 400$, $y = 920$

M1 dep

$c = 120$ or $C = (0, 120)$

A1

D = (−60, 0)

A1

M6. Right-angled triangle drawn above or below either line, with lengths indicatedorEither 2 and 6 or 3 and 9 used as a ratio or fraction

Correct substitution into gradient formula $\frac{y2-y1}{x2-x1}$ *… or inverted*

Award for $\frac{1}{3}$ *seen with no working*

M1

$\frac{2}{6}$ and $\frac{3}{9}$

A1

Both simplify to $\frac{1}{3}$ so lines parallel or have same gradient
or

Equations are $y=\frac{1}{3}x+2$ and $y=\frac{1}{3}x-3$ hence lines are parallel or lines havesame gradient

A1

[3]

M7.

Question		Working	Answer	Mark	
			$y=-\frac{1}{2}x+\frac{17}{2}$	4	M1 for M = $\left(\frac{2+4}{2},\frac{5+9}{2}\right)$ (= 3,7) M1 for gradient = $-\frac{1}{m}$ or $-\frac{1}{2}$ oe M1 (dep on 1st M1) for substitution of x = "3", y = "7" into their equation A1 for $y=-\frac{1}{2}x+\frac{17}{2}$ oe

M8.

PAPER: 1MA0_1H					
Question		**Working**	**Answer**	**Mark**	**Notes**
*		$2y=3x-4$ $y=\frac{3}{2}x-2;$ $m=\frac{3}{2}$ $\frac{3--1}{1-4}=-\frac{4}{3}$ $\frac{3}{2}\times-\frac{4}{3}=-2$	No with reason	4	M1 for $\frac{3}{2}$ oe or $y=\frac{3}{2}x\left(-\frac{4}{2}\right)$ oe M1 for method to find gradient of AB, eg $\frac{3--1}{1-4}$ **or** $\frac{-1-3}{4-1}$ **or** $-\frac{4}{3}$ oe A1 for identifying gradients as $\frac{3}{2}$ oe **and** $-\frac{4}{3}$ oe C1 (dep on M1) for a conclusion with a correct reason, eg No as product of $\frac{3}{2}$ and $-\frac{4}{3}$ is not −1, ft from their two gradients

M9.

PAPER: 5MB2H_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
			$y=\frac{10}{3}x+\frac{130}{3}$	5	B1 for stating B as (0, 5) or $OB=5$ (could be written on the diagram) B1 for C as (10, 0) or $OC=10$ (could be written on the diagram) or A is (-10, 10) or ft from their BC M1 gradient of $DA=\frac{10}{3}$ or $y=\frac{10}{3}x+c$ M1 for substitution of $x=-13,\ y=0$ or $x=-10, y=10$ in their equation A1 $y=\frac{10}{3}x+\frac{130}{3}$ oe