Aberdare Community School

Mathematics Department

WJEC GCSE

Higher – Non Calculator

Algebra

Straight line graphs

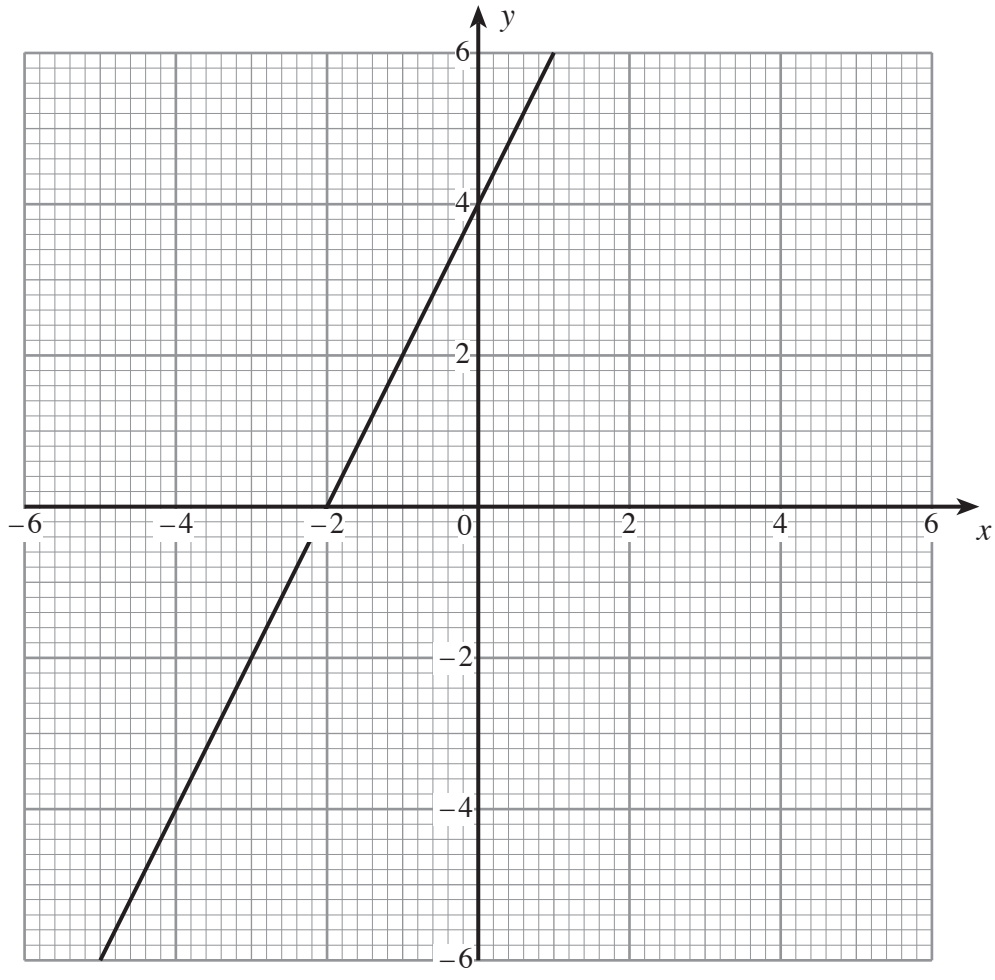
Name: .....

Set: .....

Date: .....

Teacher: .....

14. Write down the equation of the straight line shown in the following diagram in the form $y = mx + c$.



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Equation of the straight line is $y =$ ..... x + ...

[3]

13. A pyramid has a perpendicular height of x cm and a base area of 18 cm^2.
A cuboid of height 10 cm has a base in the shape of a square of side x cm.

(a) Show that the volume of the pyramid is $6x$ cm^3.

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[1]

(b) Write down an expression for the volume of the cuboid in terms of x.

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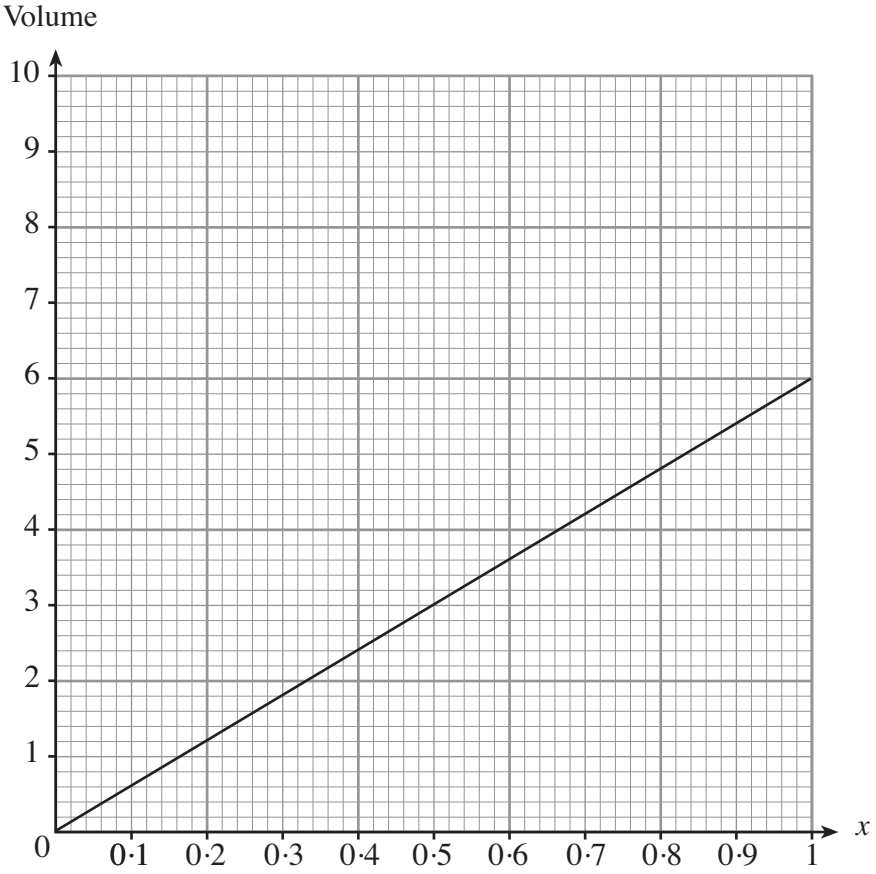
[1]

(c) On the diagram below, the graph drawn shows the volume of the pyramid for values of x from 0 to 1.



On the same diagram, draw a graph to show the volume of the cuboid for values of x from 0 to 1 using the values in the following table.

x	0	0·2	0·4	0·6	0·8	1
Volume						

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[3]

(d) Explain what the intersection of the two graphs tells you.

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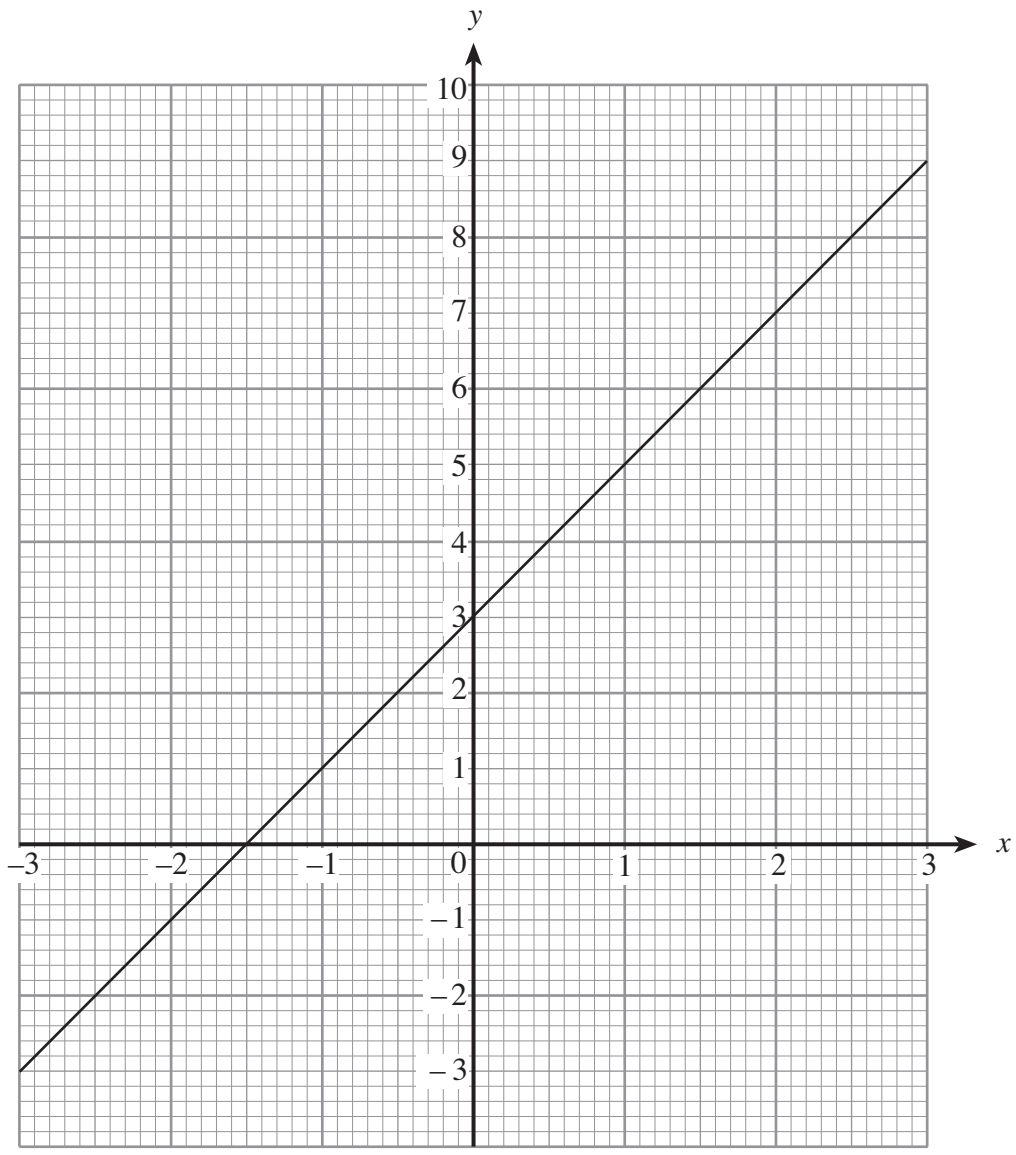
[1]

Examiner only

11. The diagram shows a straight line graph.



(a) Find the gradient of the straight line.

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[2]

(b) Write down the equation of the straight line in the form $y = mx + c$.

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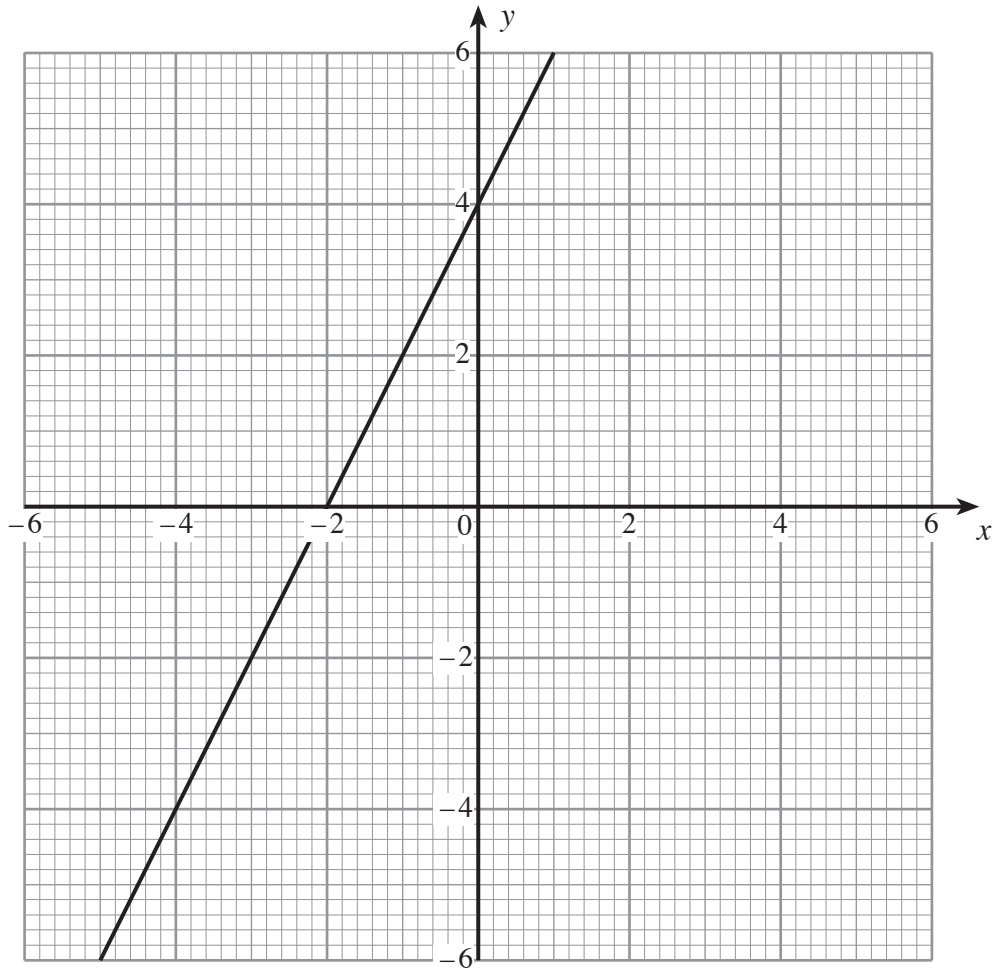
[1]

13. Write down the equation of the straight line shown in the following diagram in the form $y = mx + c$.



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Equation of the straight line is $y =$ ..... x + ...

[3]

Examiner only

10. *(a)* Use the graph paper below to draw the graph of the straight line $y = 5x + 2$.

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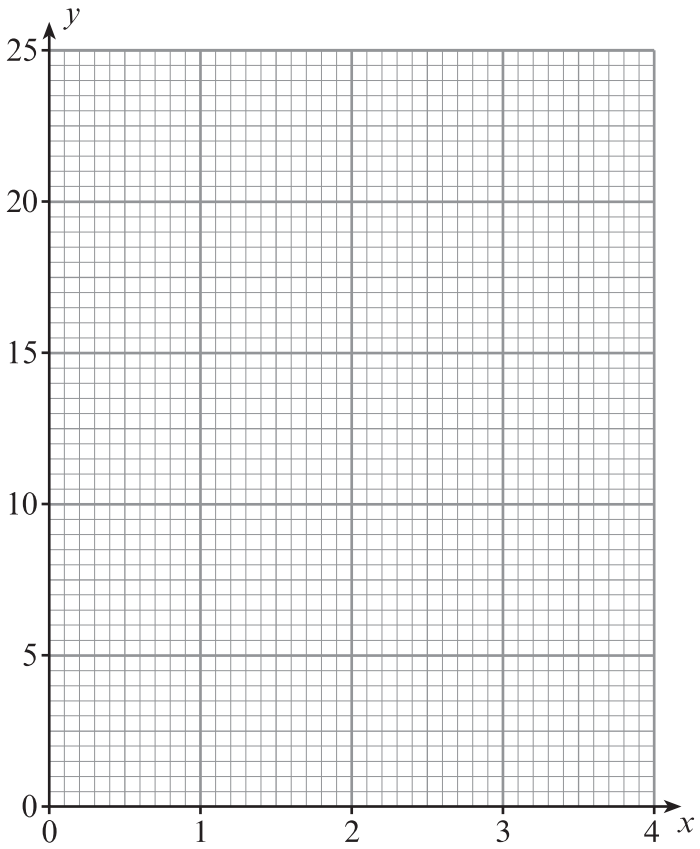
[3]



(b) Write down the equation of a straight line that is parallel to $6x + 3y - 8 = 0$.

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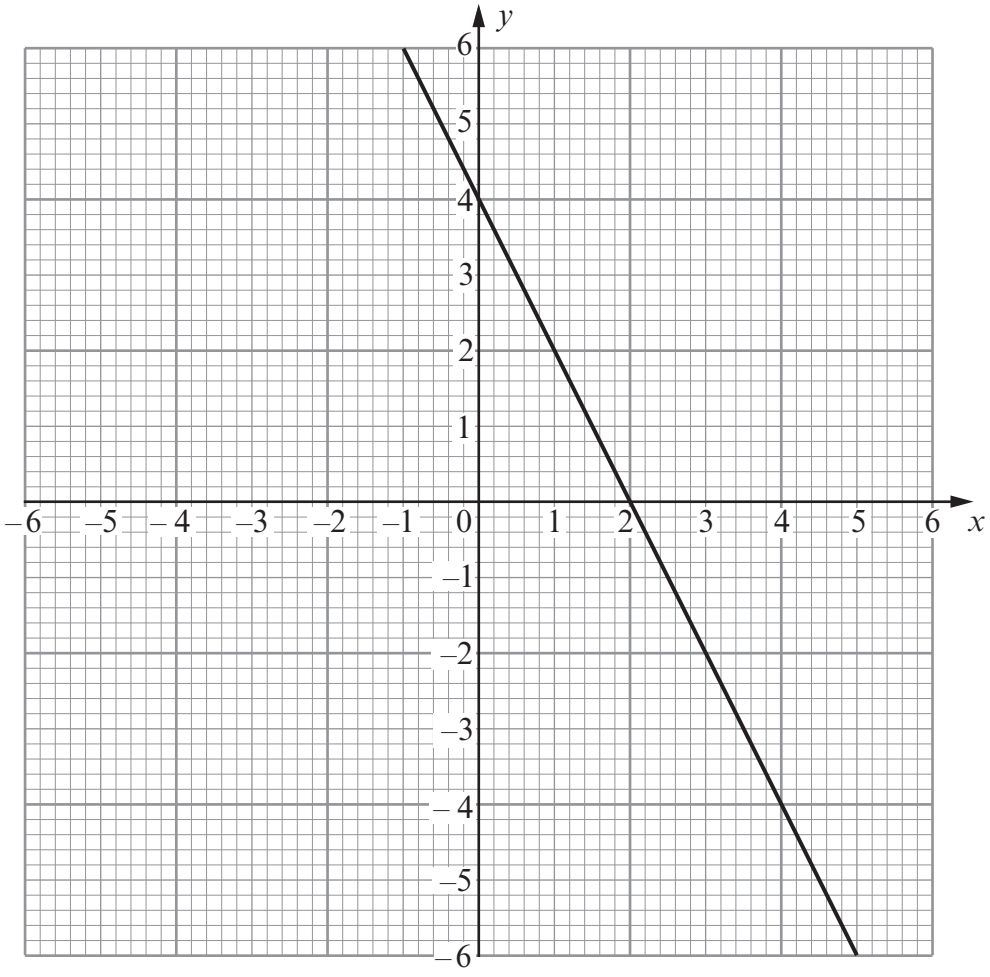
[3]

Examiner only

7. *(a)* Find the equation of the straight line shown in the following diagram. Write your answer in the form $y = mx + c$.



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Equation of the straight line is $y =$ .....

[3]

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

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[1]

(c) Find the mid-point of the straight line that joins the points with coordinates (2, –7) and (6, 13).

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[3]

Examiner only

7. Here are equations of three straight lines.

$$y = 3x + 8$$
$$2y = 6x + 15$$
$$2y = 3x + 7$$

Explain how you know which two of the three straight lines are parallel.

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[3]

Examiner only

7. Michelle has been given 6 equations and she has been asked to draw 6 graphs.
Before starting, she looks at the equations.

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

$y = 2x + 5$ $\quad$ $y = 4x + 2$ $\quad$ $y = 2x + 4$

(a) Michelle says, "the steepest graph will be $y = 2x + 5$".
Is Michelle correct?
You must give a reason for your answer.

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[1]

(b) Michelle also says, "no two graphs will be parallel to each other".
Is she correct?
You must give a reason for your answer.

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[1]

9. The equation of a straight line is given by the equation $y = mx + c$, where m and c are constants.

(a) Write down the equation of a straight line that passes through the point (0, 0).

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[1]

(b) Find the equation of a straight line passing through the points (0, 4) and (2, 8).

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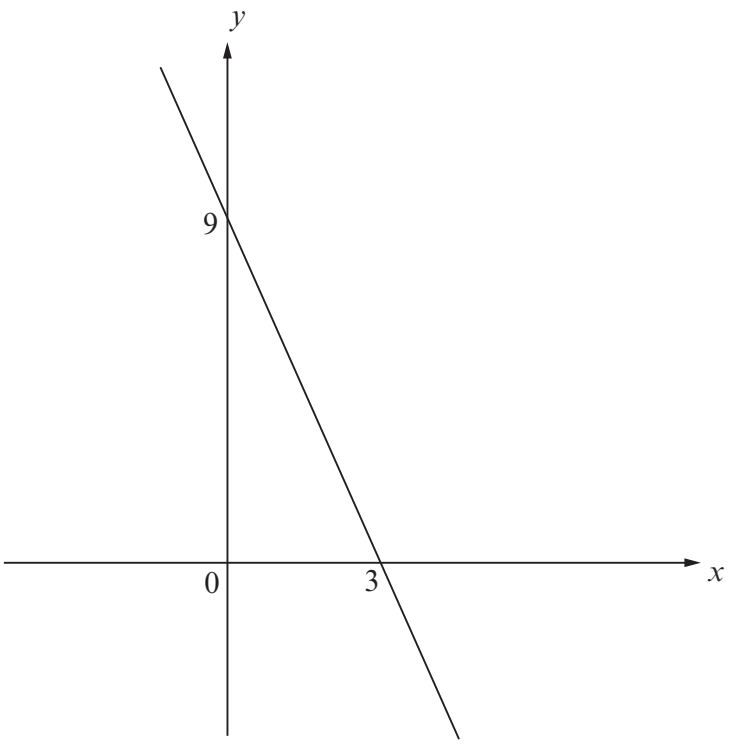
[4]

Examiner only

15.



The straight line, shown in the sketch above, intersects with another straight line which is not shown.
The other straight line is perpendicular to the straight line shown.
The two straight lines intersect at the point where $x = 1$.
Find the equation of this other straight line.

[8]

Examiner only

7. *(a)* (i) Use the graph paper below to draw the graph of $3x + 2y = 12$.

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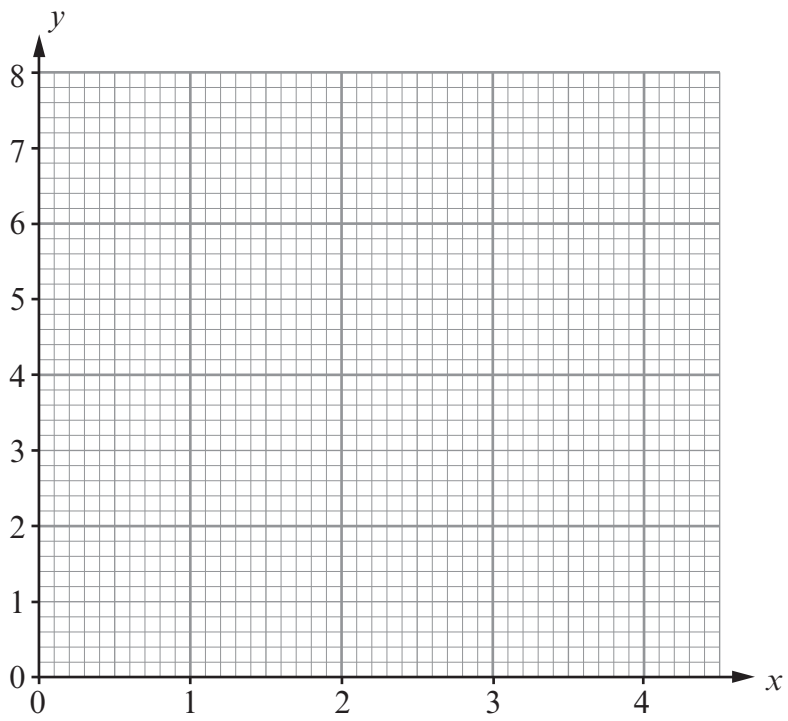
[3]



(ii) Write down the gradient of $3x + 2y = 12$.

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[1]

(b) Select from the following list of equations to complete the table below.

Equations:

A: $y + 4x = 3$ **B:** $y = 5x$ **C:** $y = 5x + 7$

D: $y - 3x = 4$ **E:** $x + y - 5 = 0$ **F:** $2y = 3x + 5$

Description	Equation
Passes through the origin (0, 0)	
Parallel to $y = 3x + 7$	
Intersects the y-axis at $y = 5$	

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[3]

[3]

10.

Line	Equation
A	$y = 3x + 4$
B	$y = -3x + 3$
C	$y = -2x - 4$
D	$y = 3x - 5$
E	$y = 4x + 4$

(a) Which two of the above lines are parallel?
You must give a clear reason for your answer.

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[2]

(b) Which two of the above lines intersect each other on the y-axis?

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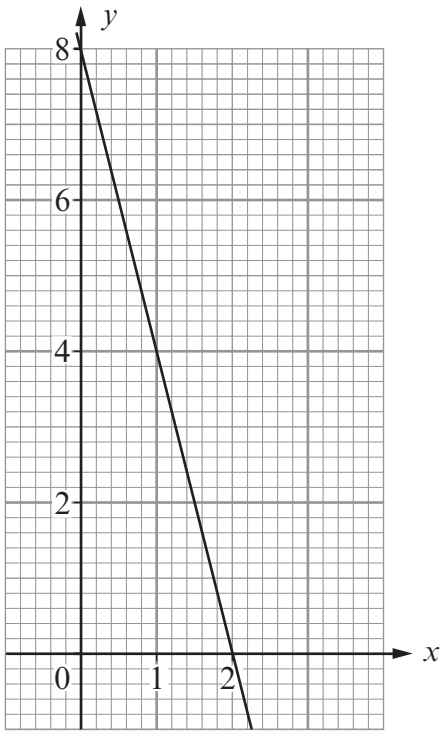
[1]

Examiner only

9. Gareth was asked to use the following clues to find the equation of a mystery straight line.

Clue 1: The mystery straight line is parallel to the one shown in the diagram below.



Clue 2: The mystery straight line passes through the point with coordinates (0, 5).

Use these clues to find the equation of the mystery straight line.

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Equation of the mystery straight line is .....

[3]

Examiner only

9. Use the following to find the equation of a straight line.

- The point that is halfway between (3, 20) and (–3, 16) lies on the straight line.
- When (–1, 10) is reflected in the y-axis, it gives another point on the straight line.

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[6]

Examiner only

10. *(a)* Use the grid below to draw graphs to represent each of the following equations.

(i) $y = \frac{1}{2}x + 6$

(ii) $x + y = 8$

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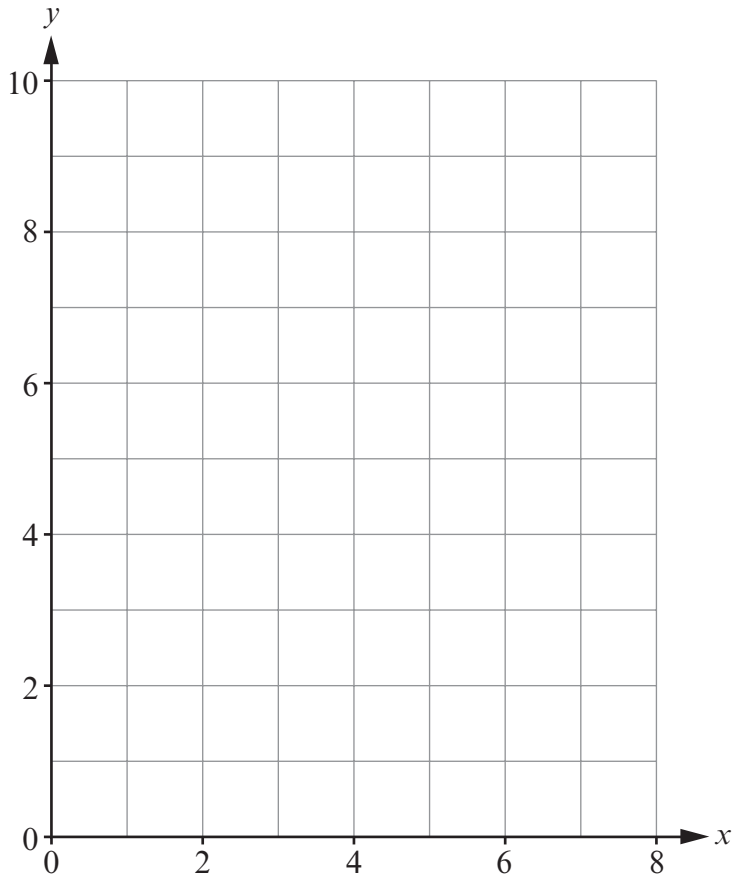
Label your lines (i) and (ii) as appropriate.



[4]

Examiner only

(b) Using your answer to *(a)*, are the lines $y = \frac{1}{2}x + 6$ and $x + y = 8$ perpendicular to each other?
Give a reason for your answer.

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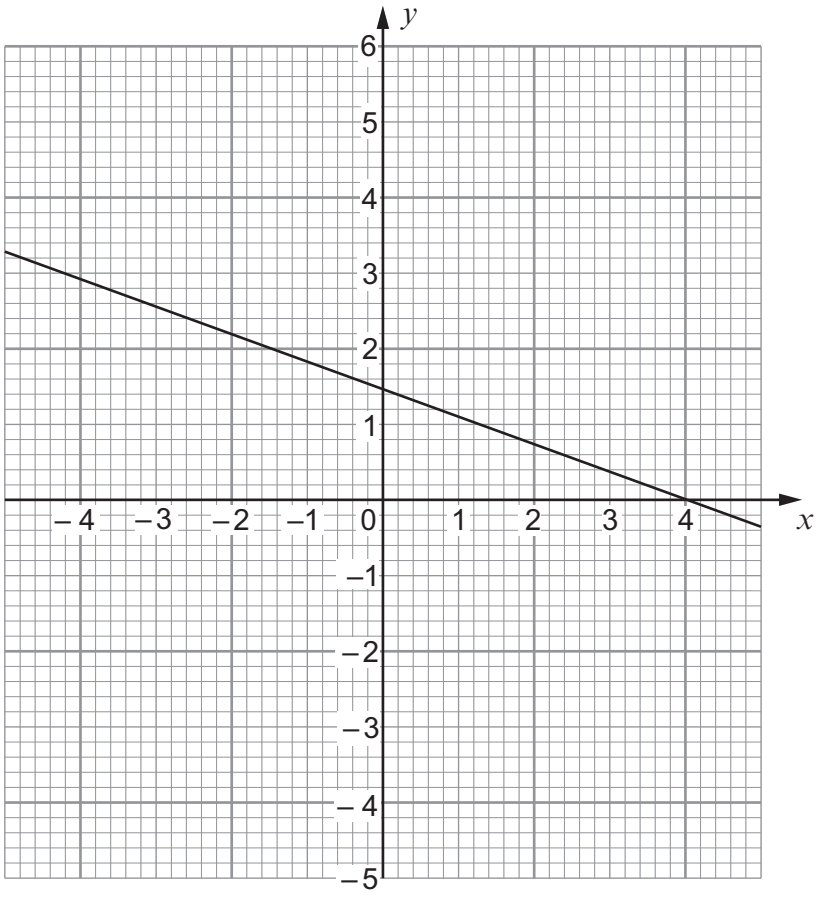
[1]

Examiner only

9. The graph of a straight line is shown below.



(a) You are asked to match one of the equations given below with the straight line.
Put a ring around your choice of equation.
You must show your working **or** give an explanation for your choice of answer. [2]

$y = -4x + 1{\cdot}5$ $\quad$ $1{\cdot}5y = 4x$ $\quad$ $8y = 3x + 12$

$8y = -3x + 12$ $\quad$ $y = 4x + 1{\cdot}5$ $\quad$ $y = -\frac{1}{2}x + 1{\cdot}5$

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Examiner only

8. *(a)* Find the gradient of the line with equation $4y = 3x - 5$. [1]

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(b) On the graph paper below, draw the straight line with equation $x + 2y = 6$. [2]

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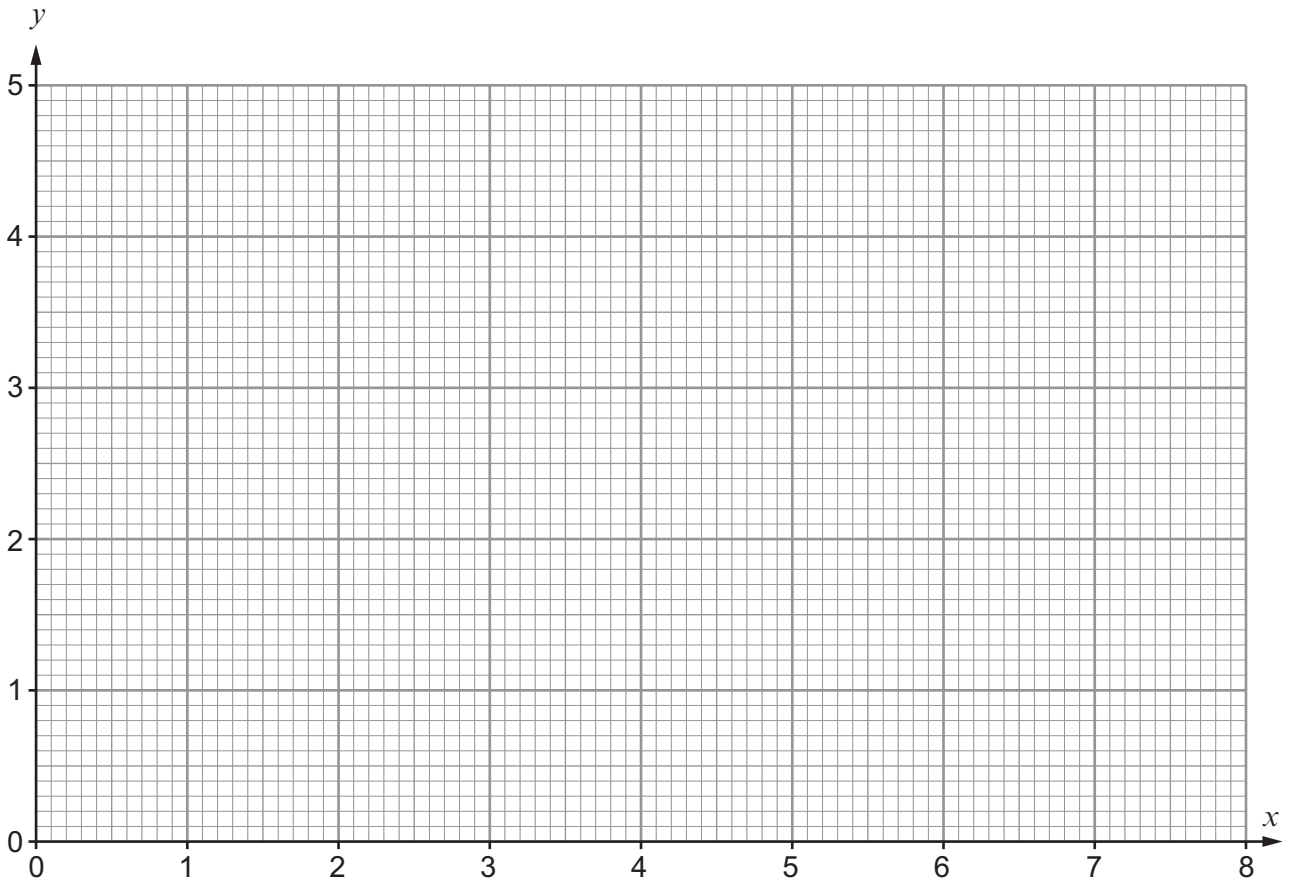

Examiner only

15. Two of the equations below represent straight lines that are perpendicular to each other.

$4y = x$ $\quad$ $4y = 3x$ $\quad$ $3y = x$

$y = x$ $\quad$ $-4y = x$ $\quad$ $y = -4x$

Select the two equations that represent lines that are perpendicular to each other.
You must show by calculation that the equations represent perpendicular lines. [3]

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Turn over.

Examiner only

4. Points are plotted on a grid.
The rule $(a, 3a)$ is used to find all the points.

(a) Does the point with coordinates $(-5, -2)$ fit the rule?
You must give a reason for your answer. [1]

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(b) Plot five possible points with coordinates that fit the rule $(a, 3a)$ on the grid. [2]

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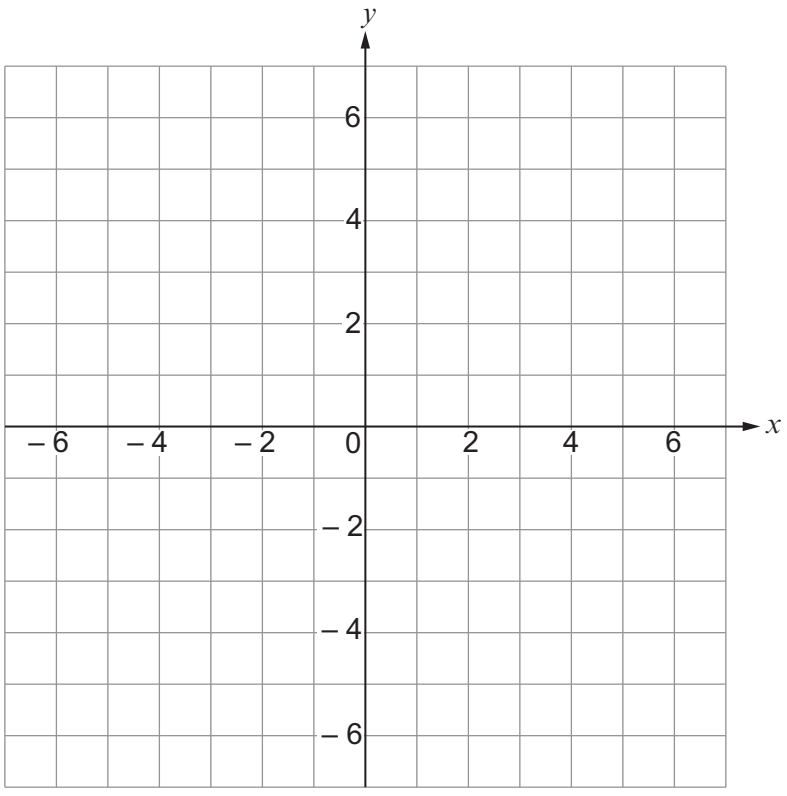

(c) Write down the equation of the straight line that passes through all the points that fit the rule $(a, 3a)$. [2]

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