Straight Line Graphs - Worksheet

Skill

Group A - Substitution

Use the equation of the straight line to work out the missing coordinate.

1) $y = x + 4$ at $(0, y)$

2) $y = 2x - 1$ at $(0, y)$

3) $y = 3x + 6$ at $(1, y)$

4) $y = 7x - 8$ at $(4, y)$

5) $y = 6 - x$ at $(5, y)$

6) $y = -2x + 4$ at $(9, y)$

7) $y = \frac{1}{2}x + 2$ at $(6, y)$

8) $y = 8x + 3$ at $(-8, y)$

9) $y = -3x - 2$ at $(-1, y)$

10) $y = 4x + 7$ at $(x, 3)$

11) $y = 12x - 0.5$ at $(x, 3.5)$

12) $y = -3x - 8$ at $(x, -29)$

Group B - Points of intersection

State the gradient m and the y-intercept c for the following equations of straight lines:

1) $y = 2x + 1$

2) $y = 3x + 6$

3) $y = x + 1.5$

4) $y = 2x - 3$

5) $y = 5x - 4$

6) $y = 2.5x - 10$

7) $y = -2x + 3$

8) $y = -x + 6$

9) $y = -4x + 7$

10) $y = -4x - 3$

11) $y = -2x - 0.5$

12) $y = -0.5x - 8$

Group C - Drawing straight line graphs

Plot each of these straight lines. Axes templates are provided.

1) $y = x + 3$

2) $y = 4x + 1$

3) $y = 3x - 2$

4) $y = 10 - x$

5) $y = 4 - 2x$

6) $y = 9 - 3x$

7) $x + y = 4$

8) $x + y = 2$

9) $2x + y = 4$

10) $2x + y = 16$

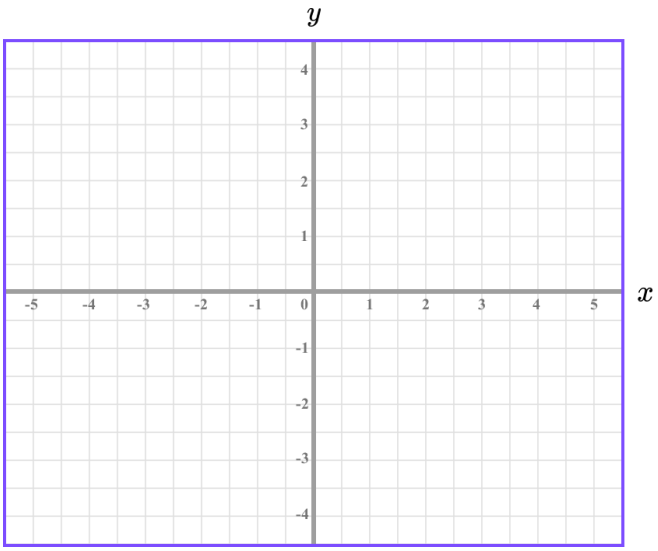
11) $2x + 3y = 18$

12) $2x + 3y = -6$

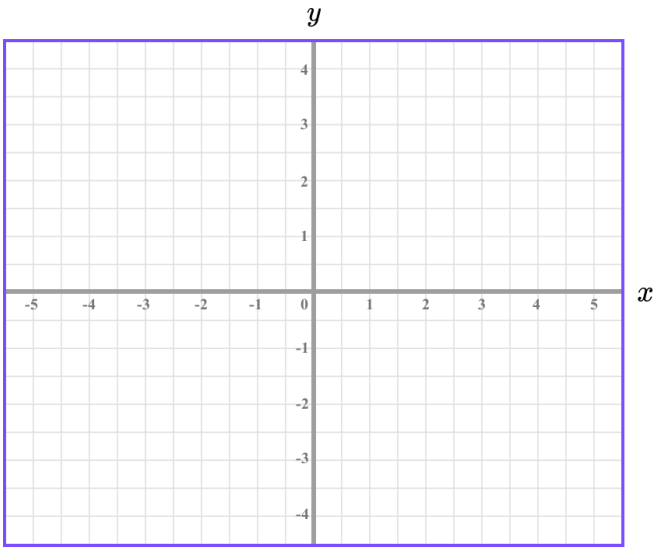
Straight Line Graphs - Worksheet

Group C - Templates

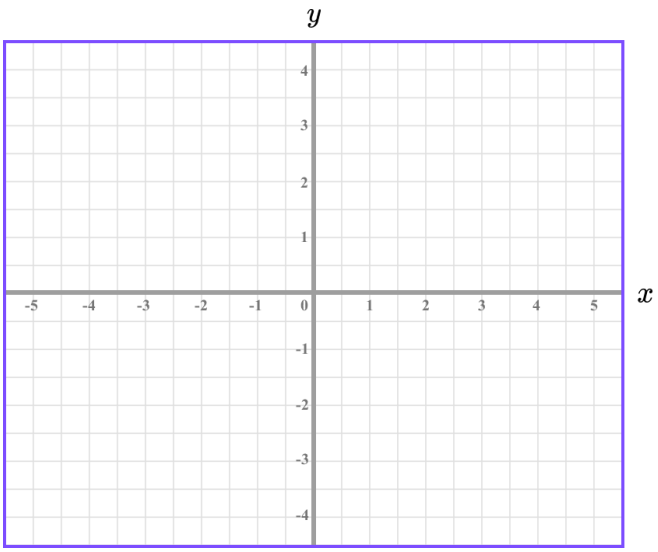
1)



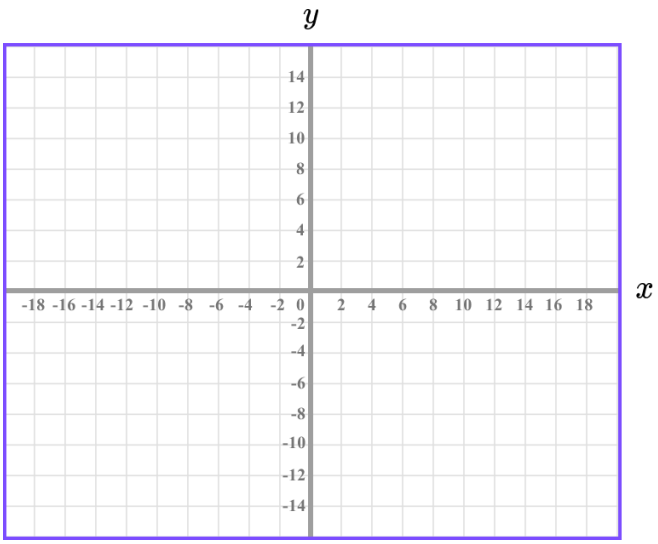
2)



3)

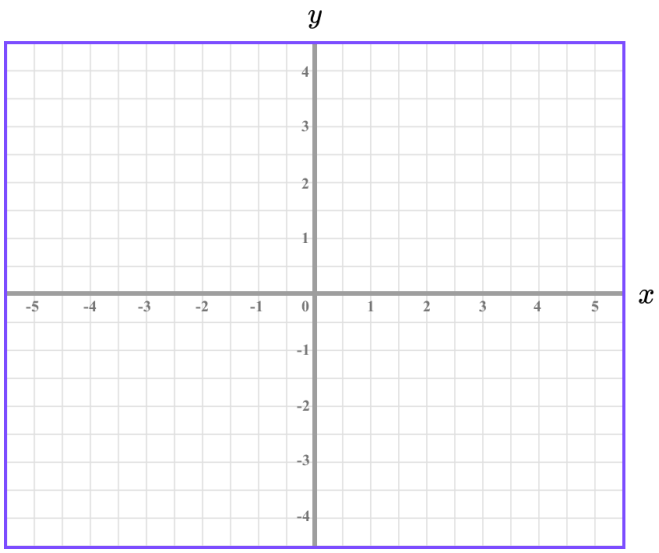


4)



Straight Line Graphs - Worksheet

5)



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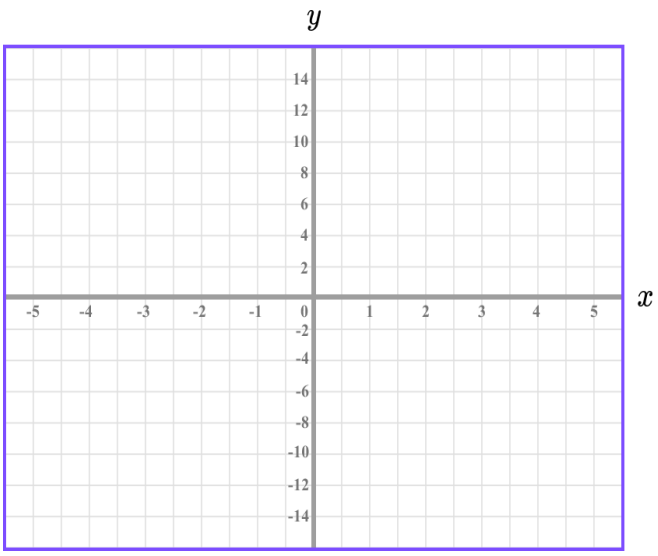
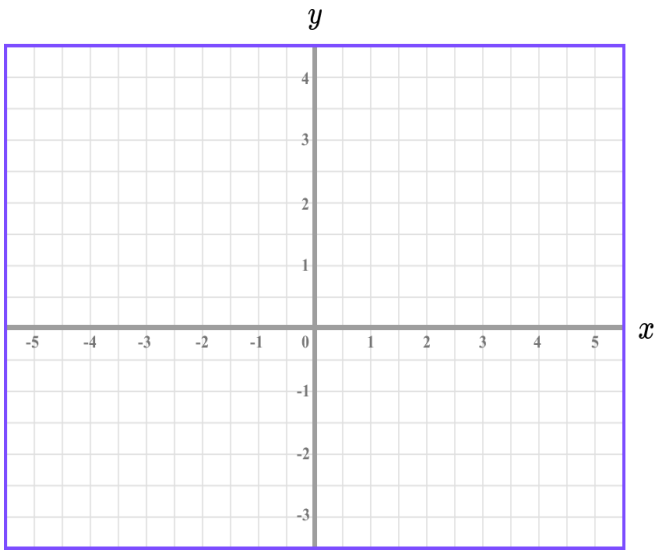
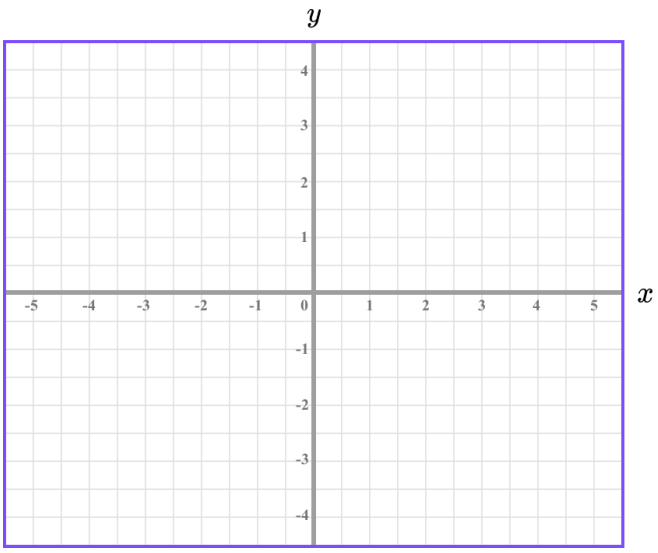


7)

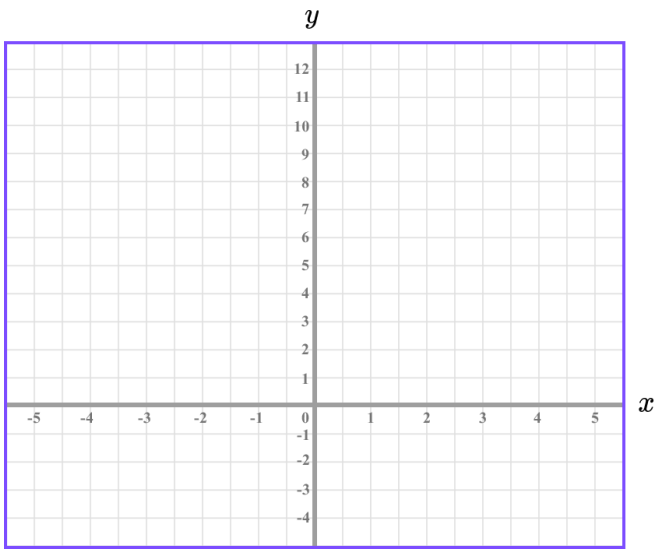


8)

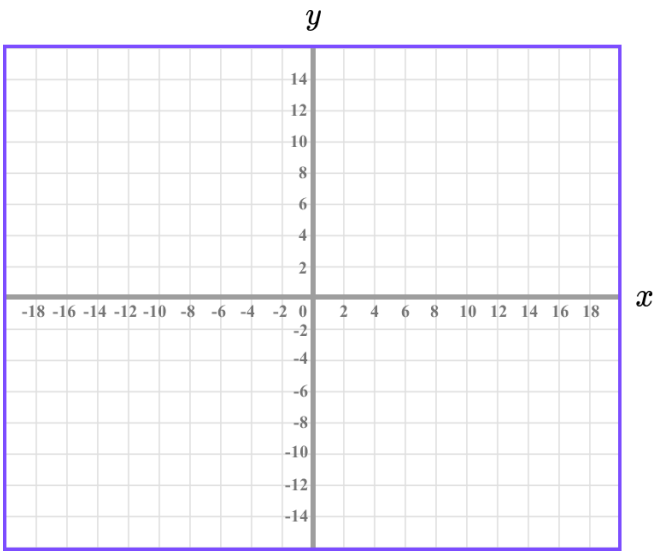


Straight Line Graphs - Worksheet

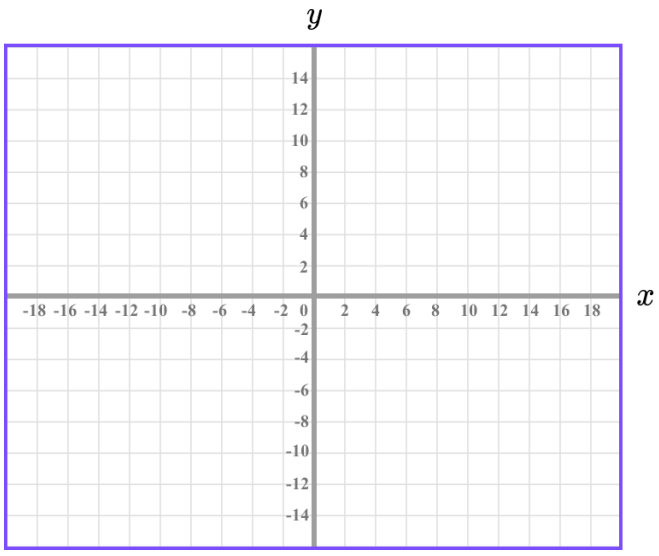
9)



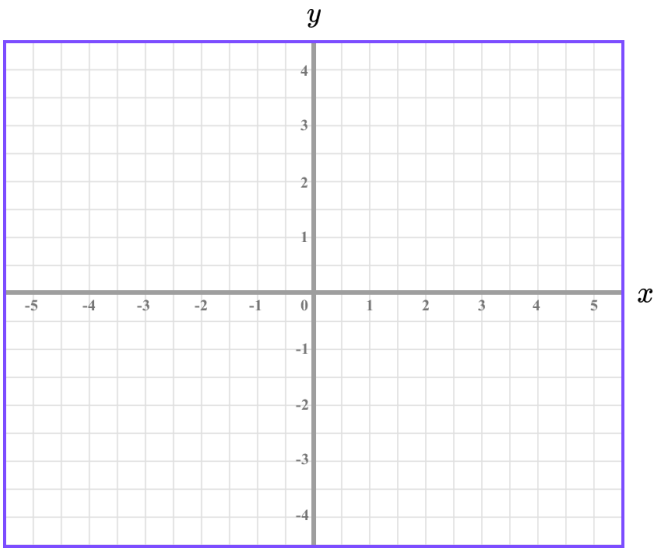
10)



11)



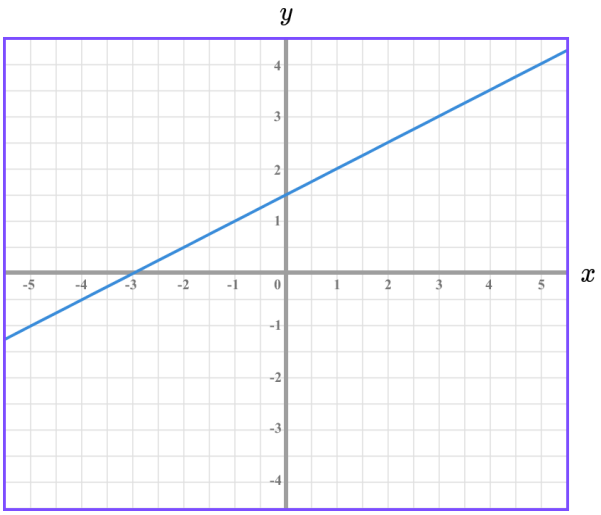
12)



Straight Line Graphs - Worksheet

Applied

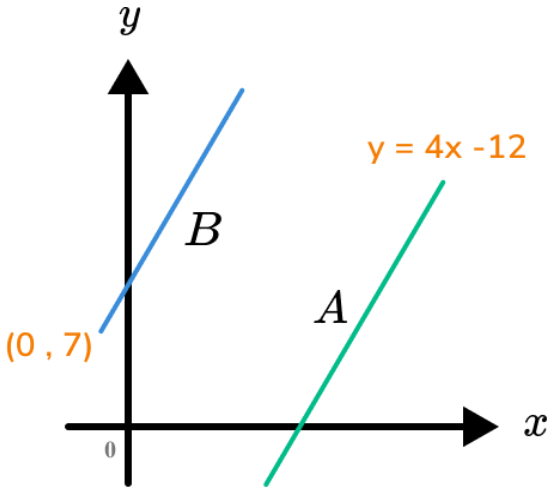
1) **a)** Calculate the gradient of the straight line in the diagram below:



b) State the y-intercept of the line.

c) Write down the equation of the line.

2) **a)** Lines A and B are parallel. Use the information provided to find the equation of Line B.

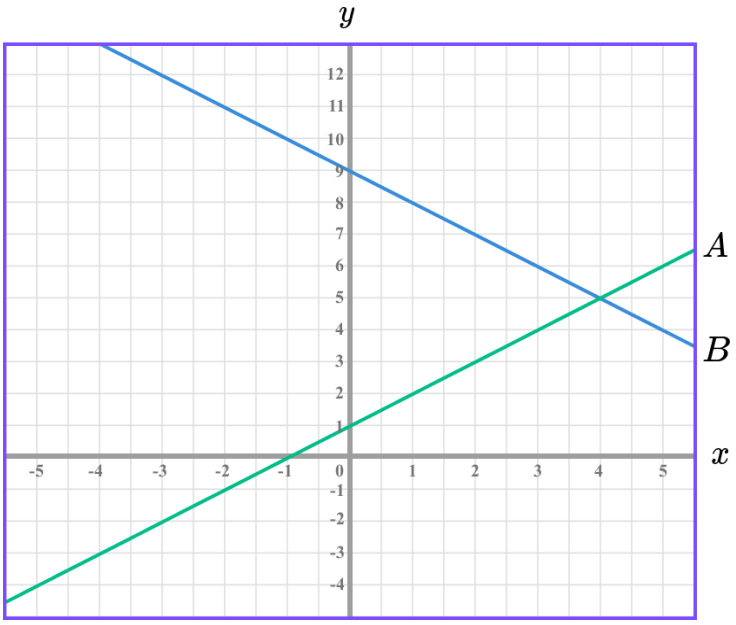


b) Which line (A or B) does the point $(16, 52)$ lie on? Show your working.

Straight Line Graphs - Worksheet

3) **a)** Two lines intersect at the point $(4, 5)$. The lines are perpendicular to one another. One line has the equation $x = 4$. State the equation of the other line.

b) Show that the lines are perpendicular.

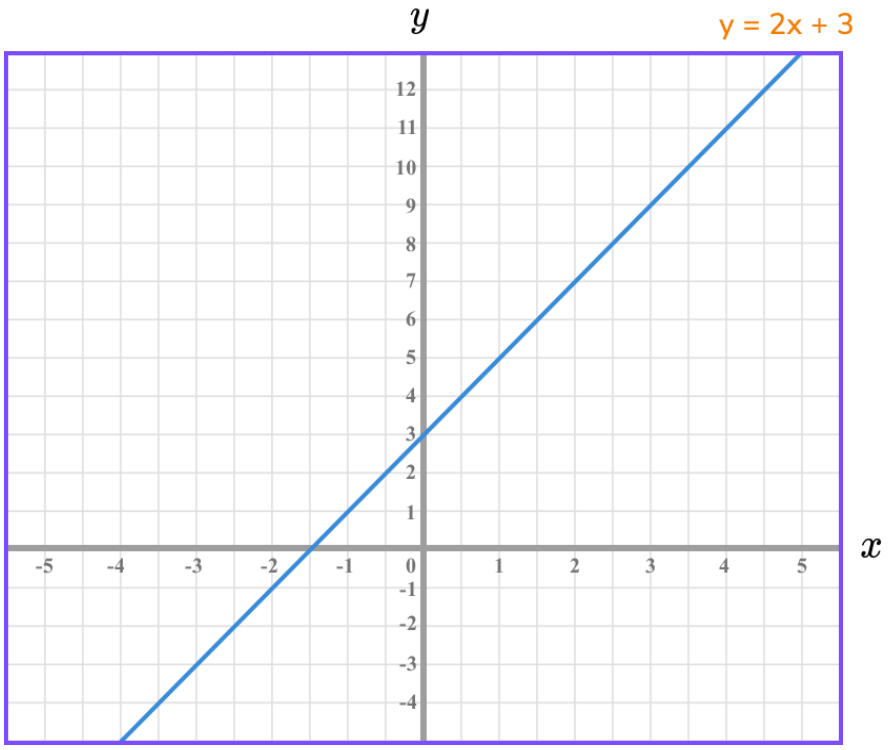


4) **a)** Two lines A and B intersect one another at the origin. Line B is twice as steep as Line A. The point $(6, -24)$ lies on line B. Calculate the gradient of line A.

b) Line C is parallel to the y axis, intersecting the x axis at the point $(5, 0)$. Calculate the point of intersection between Line C and Line B.

Straight Line Graphs - Exam Questions

1) The grid below shows the graph of $y = 2x + 3$.



(a) Draw the graph of $y = 3 - 2x$ on the same grid. **(2)**

(b) Use your graph to solve $2x + 3 = 3 - 2x$.

.....

(1)

(c) Beyza says "the lines are perpendicular because the angle between them is 90° ". Explain why Beyza is incorrect.

.....

(2)

(5 marks)

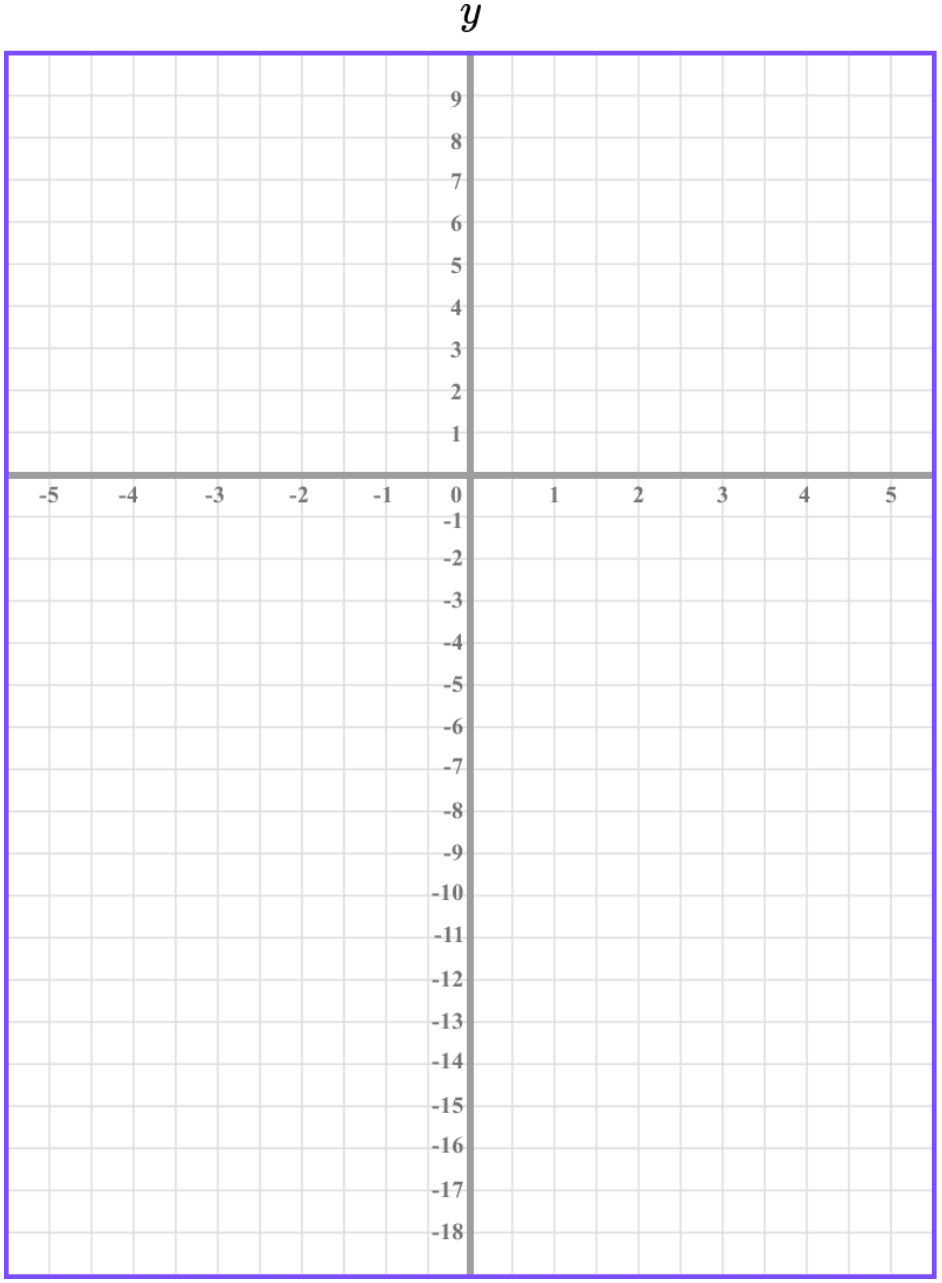
Straight Line Graphs - Exam Questions

2) **(a)** Complete the table for $y = 5x - 7$ for $-2 \leq x \leq 3$.

x	-2	-1	0	1	2	3
y						

(3)

(b) Draw the graph of $y = 5x - 7$ using the set of axes provided.



(2)

(5 marks)

Straight Line Graphs - Exam Questions

3) The line L goes through the points $(5, 8)$ and $(7, 16)$.

Work out the equation of the line.

.....

(3 marks)

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4) (a) Calculate the gradient of the line perpendicular to the equation

$$x = \frac{3y+24}{12}$$

.....

(3)

(b) The perpendicular line goes through the point $(8, 2)$.

Find the equation of the perpendicular line.

.....

(2)

(5 marks)

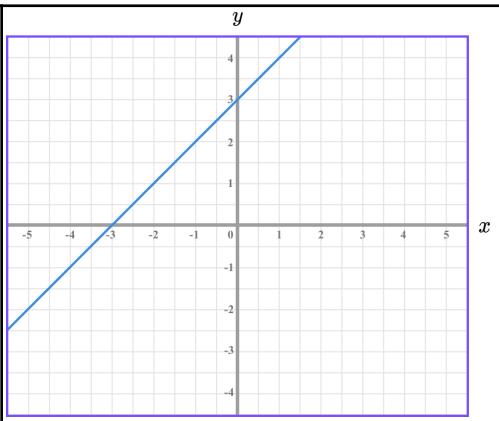
Straight Line Graphs - Answers

	Question	Answer
	Skill Questions	
Group A	Use the equation of the straight line to work out the missing coordinate **1)** $y = x + 4$ at $(0, y)$ **2)** $y = 2x - 1$ at $(0, y)$ **3)** $y = 3x + 6$ at $(1, y)$ **4)** $y = 7x - 8$ at $(4, y.)$ **5)** $y = 6 - x$ at $(5, y)$ **6)** $y = -2x + 4$ at $(9, y.)$ **7)** $y = \frac{1}{2}x + 2$ at $(6, y)$ **8)** $y = 8x + 3$ at $(-8, y)$ **9)** $y = -3x - 2$ at $(-1, y)$ **10)** $y = 4x + 7$ at $(x, 3)$ **11)** $y = 12x - 0.5$ at $(x, 3.5)$ **12)** $y = -3x - 8$ at $(x, -29)$	**1)** $(0, 4)$ **2)** $(0, -1)$ **3)** $(1, 9)$ **4)** $(4, 20)$ **5)** $(5, 1)$ **6)** $(9, -14)$ **7)** $(6, 5)$ **8)** $(-8, -61)$ **9)** $(-1, 1)$ **10)** $(-1, 3)$ **11)** $(\frac{1}{3}, 3.5)$ **12)** $(7, -29)$
Group B	State the gradient m and the y-intercept c for the following equations of straight lines: **1)** $y = 2x + 1$ **2)** $y = 3x + 6$ **3)** $y = x + 1.5$ **4)** $y = 2x - 3$ **5)** $y = 5x - 4$ **6)** $y = 2.5x - 10$ **7)** $y = -2x + 3$ **8)** $y = -x + 6$ **9)** $y = -4x + 7$ **10)** $y = -4x - 3$ **11)** $y = -2x - 0.5$ **12)** $y = -0.5x - 8$	**1)** $m = 2, \quad c = 1$ **2)** $m = 3, \quad c = 6$ **3)** $m = 1, \quad c = 1.5$ **4)** $m = 2, \quad c = -3$ **5)** $m = 5, \quad c = -4$ **6)** $m = 2.5, \quad c = -10$ **7)** $m = -2, \quad c = 3$ **8)** $m = -1, \quad c = 6$ **9)** $m = -4, \quad c = 7$ **10)** $m = -4, \quad c = -3$ **11)** $m = -2, \quad c = -0.5$ **12)** $m = -0.5, \quad c = -8$

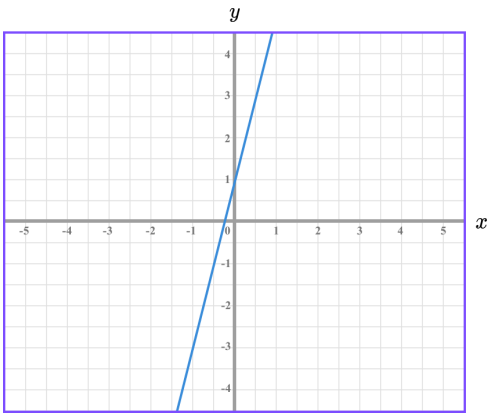
Straight Line Graphs - Answers

Group C

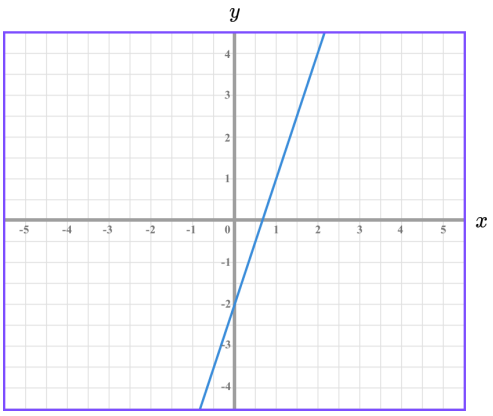
1) $y = x + 3$



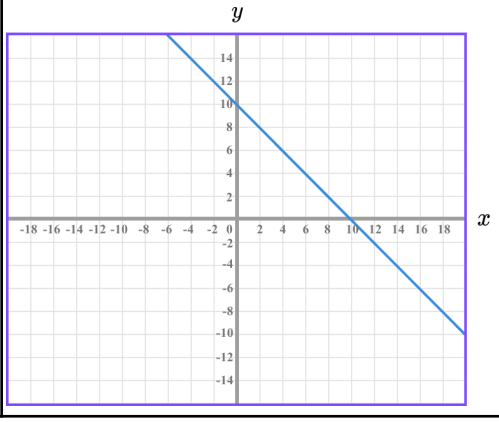
2) $y = 4x + 1$



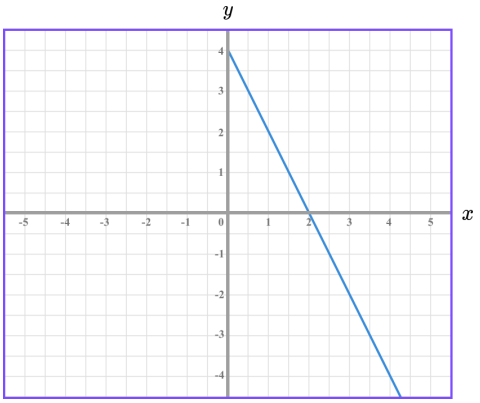
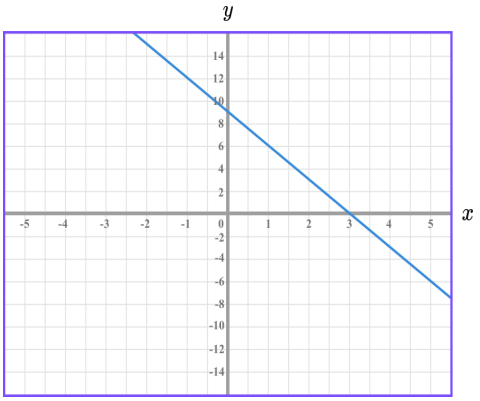
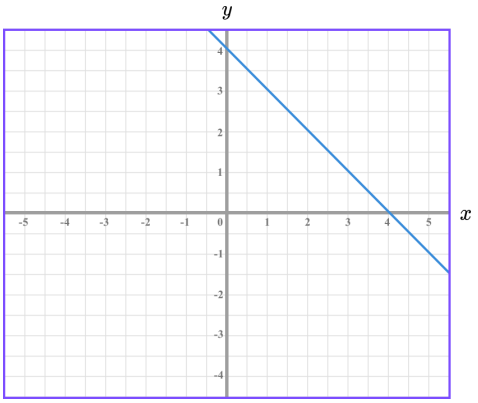
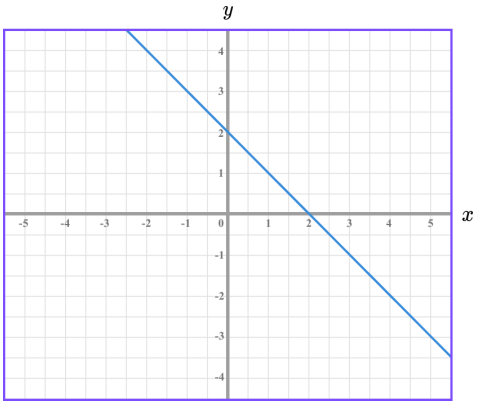
3) $y = 3x - 2$



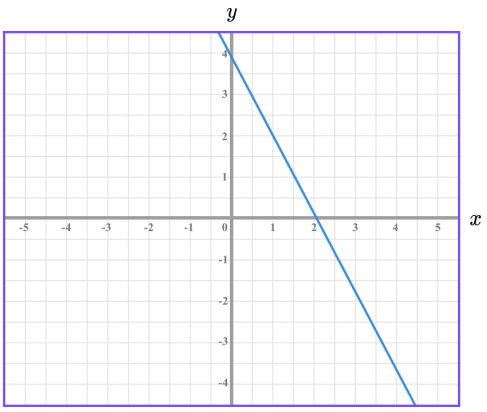
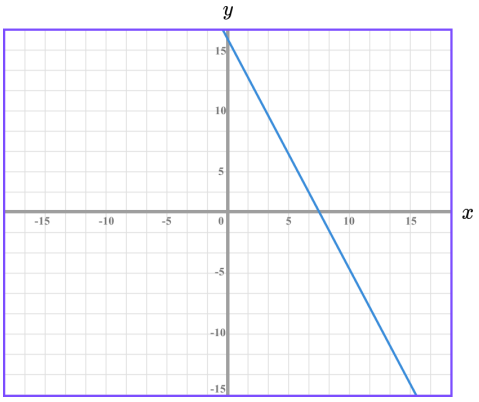
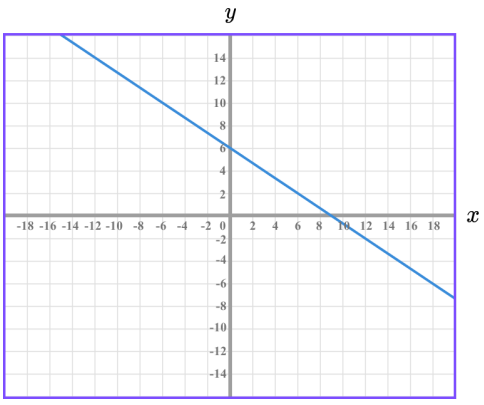
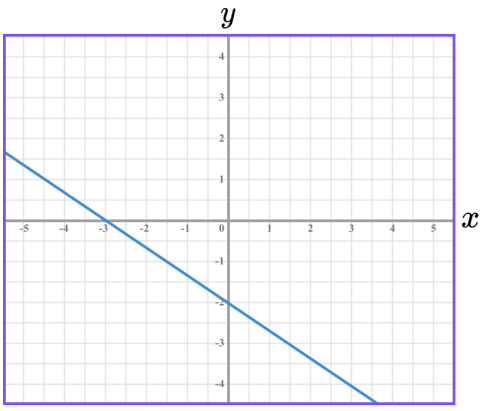
4) $y = 10 - x$



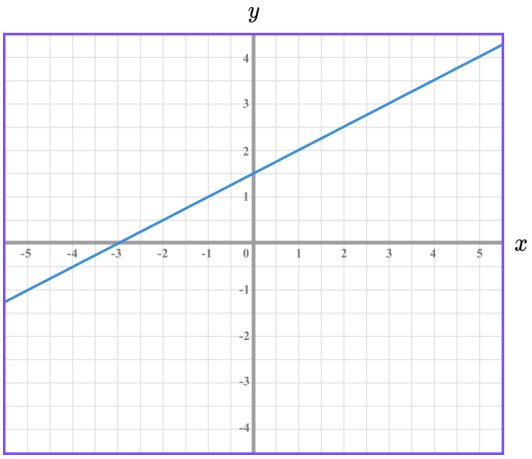
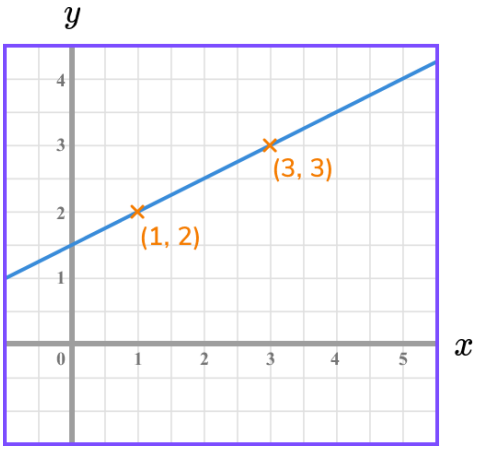
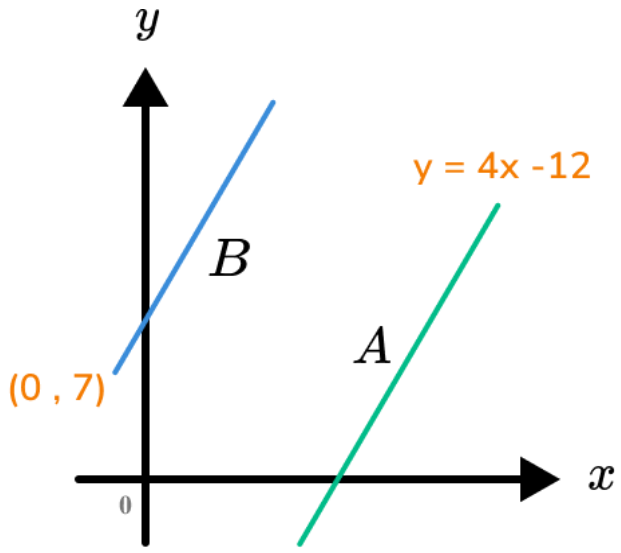
Straight Line Graphs - Answers

Group C contd	**5)** $y = 4 - 2x$	
	6) $y = 9 - 3x$	
	7) $x + y = 4$	
	8) $x + y = 2$	

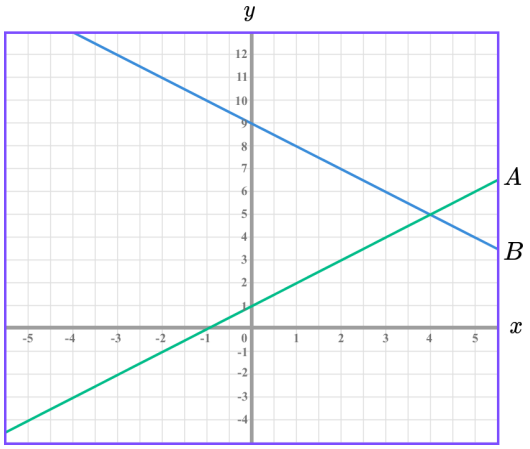
Straight Line Graphs - Answers

Group C	**9)** $2x + y = 4$	
	10) $2x + y = 16$	
	11) $2x + 3y = 18$	
	12) $2x + 3y = -6$	

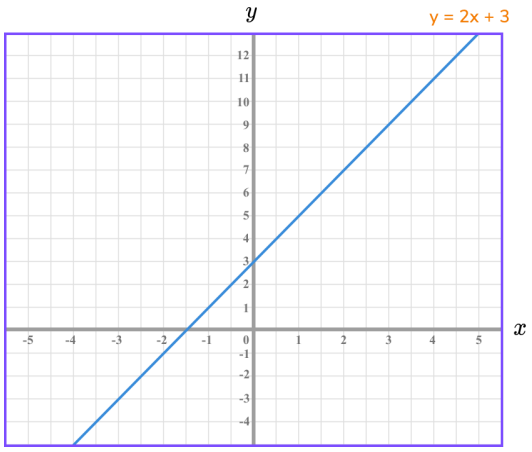
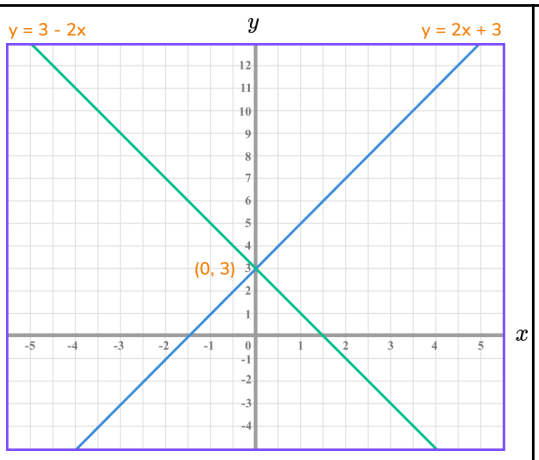
Straight Line Graphs - Answers

	Question	Answer
	Applied Questions	
1)	**a)** Calculate the gradient of the straight line in the diagram below:  **b)** State the y-intercept of the line. **c)** Write down the equations of the line.	**a)**  $m = \frac{3-2}{3-1} = \frac{1}{2}$ **b)** $c = 1.5$ **c)** $y = \frac{1}{2}x + 1.5$
2)	**a)** Lines A and B are parallel. Use the information provided to find the equation of Line B.  	**a)** gradient $= 4$ y-intercept $= 7$ equation $y = 4x + 7$

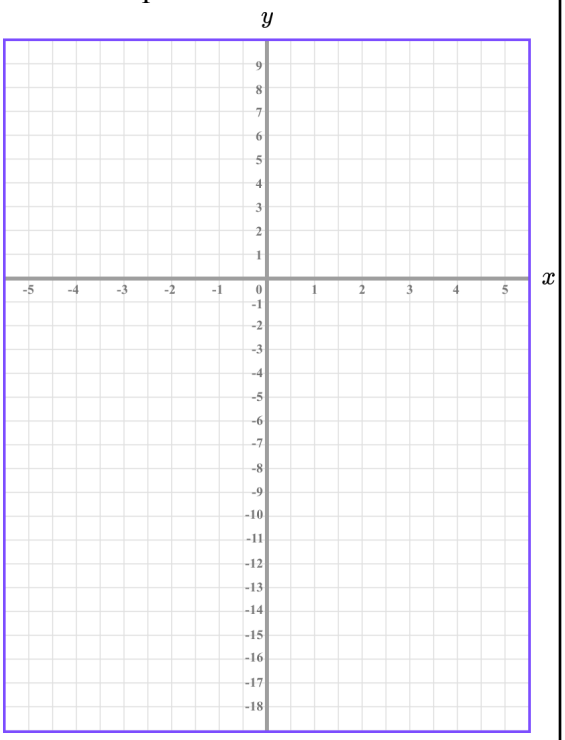
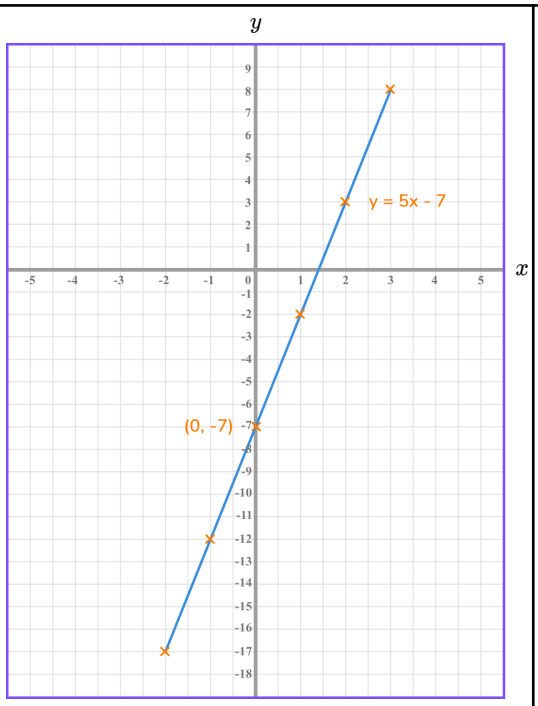
Straight Line Graphs - Answers

	b) Which line (A or B) does the point $(16, 52)$ lie on? Show your working.	**b)** Substitute $x = 16$ into Line A $y = 4x - 12$ $y = 4 \times 16 - 12 = 52$ Correct - so point $(16, 52)$ is on Line A Substitute $x = 16$ into Line B $y = 4x + 7$ $y = 4 \times 16 + 7 = 71$ Incorrect - so point $(16, 52)$ is NOT on Line B
3)	**a)** Two lines intersect at the point $(4, 5)$. The lines are perpendicular to one another. One line has the equation $x = 4$. State the equation of the other line. **b)** Show that the lines are perpendicular. 	**a)** $y = 5$ **b)** Line A: $y = x + 1$ Line B: $y = 9 - x$ $1 \times -1 = -1$ Product of gradients = -1 Perpendicular
4)	**a)** Two lines A and B intersect one another at the origin. Line B is twice as steep as Line A. The point $(6, -24)$ lies on line B. Calculate the gradient of line A. **b)** The Line C is parallel to the y axis, intersecting the x axis at the point (5,0). Calculate the point of intersection between Line C and Line B.	**a)** Line B: $m = \frac{-24-0}{6-0} = -4$ Gradient of Line $A = -2$ Line B: $y = -4x$ **b)** Line C: $x = 5$ Substitute into Line B: $y = -4 \times 5$ $y = -20$ $(5, -20)$

Straight Line Graphs - Mark Scheme

	Question	Answer	
	Exam Questions		
1) (a)	The grid below shows the graph of $y = 2x + 3$. Draw the graph of $y = 3 - 2x$ on the same grid. 	(a)  y-intercept $(0, 3)$ or gradient -2 Correct straight line drawn	(1) (1)
(b)	Use your graph to solve $2x + 3 = 3 - 2x$.	(b) $x = 0$	(1)
(c)	Beyza says "the lines are perpendicular because the angle between them is 90°". Explain why Beyza is incorrect.	(c) Product of the gradients is: $2 \times -2 = -4$ For two straight lines to be perpendicular, the product of their gradients should equal -1 **oe**	(1) (1)
2) (a)	Complete the table for $y = 5x - 7$ for $-2 \leq x \leq 3$ x: -2, -1, 0, 1, 2, 3 y:	(a) x: -2, -1, 0, 1, 2, 3 y: **-17, -12, -7, -2, 3, 8** 2 correct values 4 correct values All values correct	(1) (1) (1)

Straight Line Graphs - Mark Scheme

(b)	Draw the graph of $y = 5x - 7$ using the set of axes provided. 	 At least 5 points plotted accurately Straight line drawn and graph fully correct	**(1)** **(1)**
3)	The line L goes through the points $(5, 8)$ and $(7, 16)$. Work out the equation of the line.	$\frac{16-8}{7-5} = \frac{8}{2} = 4$ Gradient is 4 $y = 4x + c$, goes through $(5, 8)$ $8 = 4 \times 5 + c$ $c = -12$ Equation $y = 4x - 12$	**(1)** **(1)** **(1)**

Straight Line Graphs - Mark Scheme

4) (a)	Calculate the gradient of the line perpendicular to the equation $x = \frac{3y+24}{12}$.	Rearranging into the form $y = mx + c$ $x = \frac{3y + 24}{12}$ $\times 12 \quad \times 12$ $12x = 3y + 24$ $-24 \quad -24$ $12x - 24 = 3y$ $3y = 12x - 24$ $\div 3 \quad \div 3$ $y = 4x - 8$ $m = 4$ Perpendicular has a gradient of $\frac{-1}{4}$	**(1)** **(1)** **(1)**
(b)	The perpendicular line goes through the point $(8, 2)$. Find the equation of the perpendicular line.	$y = \frac{-1}{4}x + c$ goes through $(8, 2)$ $2 = \frac{-1}{4} \times 8 + c$ $c = 4$ $y = \frac{-1}{4}x + 4$	 **(1)** **(1)**