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EDEXCEL GCSE (9-1) MATHS: QUESTIONS BY TOPIC

Graphs (A4)

GCSE (9-1) Mathematics (1MA1) · Foundation tier

68 questions · 226 marks · Mark schemes included

Past papers June 2017 - June 2025 · 4 sub-topics

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HOW TO USE THIS BOOKLET

Questions are grouped by sub-topic and run from the lowest to the highest mark tariff, then oldest paper first.

Click any row below to jump straight to that sub-topic or question.

On every question page, click ANSWER in the top-right corner to jump to its mark scheme; < QUESTION brings you back.

A gold bar in the left margin marks exactly where the question sits on the original page.

Diagrams, graphs, grids and tables are printed exactly as they appear in the original papers.

Each question is filed under its main topic; longer questions may also test skills from other topics.

QUESTION	SOURCE	MARKS	PAGE
A4a COORDINATES & STRAIGHT-LINE GRAPHS		33 Qs · 101 marks	3
1. Q29	GCSE Paper 2F November 2020	1	4
2. Q5	GCSE Paper 3F November 2021	1	5
3. Q26	GCSE Paper 1F June 2017	2	6
4. Q13	GCSE Paper 3F June 2018	2	7
5. Q10	GCSE Paper 1F November 2019	2	8
6. Q28	GCSE Paper 1F November 2021	2	9
7. Q15	GCSE Paper 1F November 2022	2	10
8. Q25	GCSE Paper 1F June 2018	3	11
9. Q22	GCSE Paper 2F June 2018	3	12
10. Q8	GCSE Paper 1F November 2018	3	13
11. Q25	GCSE Paper 2F November 2018	3	14
12. Q21	GCSE Paper 2F June 2019	3	15
13. Q8	GCSE Paper 1F November 2020	3	16
14. Q18	GCSE Paper 1F November 2021	3	17
15. Q17	GCSE Paper 2F June 2022	3	18
16. Q9	GCSE Paper 3F November 2022	3	19
17. Q14	GCSE Paper 1F November 2023	3	20
18. Q28	GCSE Paper 3F November 2023	3	21
19. Q19	GCSE Paper 3F June 2024	3	22
20. Q8	GCSE Paper 1F November 2024	3	23
21. Q27	GCSE Paper 3F November 2024	3	24
22. Q25	GCSE Paper 1F June 2025	3	25
23. Q9	GCSE Paper 3F June 2025	3	26
24. Q28	GCSE Paper 3F June 2025	3	27
25. Q7	GCSE Paper 1F November 2017	4	28
26. Q17	GCSE Paper 3F November 2019	4	30
27. Q8	GCSE Paper 2F June 2022	4	31
28. Q25	GCSE Paper 2F June 2022	4	32
29. Q9	GCSE Paper 1F June 2023	4	33
30. Q25	GCSE Paper 1F June 2024	4	34
31. Q8	GCSE Paper 2F June 2024	4	35
32. Q13	GCSE Paper 3F November 2017	5	36
33. Q24	GCSE Paper 1F June 2018	5	37



QUESTION	SOURCE	MARKS	PAGE
A4b	QUADRATIC & OTHER GRAPHS	19 Qs · 71 marks	38
34. Q29	GCSE Paper 1F November 2017	1	39
35. Q25	GCSE Paper 2F November 2019	2	40
36. Q22	GCSE Paper 1F November 2020	2	41
37. Q28	GCSE Paper 3F November 2021	2	42
38. Q26	GCSE Paper 3F June 2023	2	43
39. Q28	GCSE Paper 2F June 2025	2	44
40. Q29	GCSE Paper 1F June 2019	3	45
41. Q28	GCSE Paper 2F June 2023	3	46
42. Q22	GCSE Paper 3F June 2017	4	47
43. Q24	GCSE Paper 2F November 2020	4	48
44. Q24	GCSE Paper 2F November 2022	4	49
45. Q20	GCSE Paper 2F November 2023	4	51
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47. Q22	GCSE Paper 3F November 2018	5	53
48. Q21	GCSE Paper 1F June 2025	5	54
49. Q24	GCSE Paper 2F June 2018	6	55
50. Q24	GCSE Paper 2F November 2021	6	57
51. Q28	GCSE Paper 1F June 2022	6	58
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A4c	REAL-LIFE GRAPHS & RATES OF CHANGE	16 Qs · 54 marks	60
53. Q24	GCSE Paper 1F November 2024	1	61
54. Q12	GCSE Paper 1F November 2018	3	62
55. Q16	GCSE Paper 1F November 2019	3	63
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58. Q18	GCSE Paper 3F November 2020	3	67
59. Q14	GCSE Paper 2F November 2021	3	68
60. Q14	GCSE Paper 3F November 2022	3	69
61. Q16	GCSE Paper 2F June 2024	3	70
62. Q14	GCSE Paper 2F November 2024	3	71
63. Q11	GCSE Paper 2F June 2017	4	72
64. Q19	GCSE Paper 3F November 2022	4	74
65. Q10	GCSE Paper 2F June 2023	4	75
66. Q11	GCSE Paper 3F November 2024	4	76
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68. Q13	GCSE Paper 3F June 2023	5	79
A4d	GRAPH TRANSFORMATIONS & CIRCLE EQUATIONS		

No questions on this sub-topic in the available past papers.



QUESTIONS

68 questions · 226 marks · 3 sub-topics

SUB-TOPIC A4a

COORDINATES & STRAIGHT-LINE GRAPHS

Sub-topic A4a · 33 questions · 101 marks · lowest tariff first



28 Each exterior angle of a regular polygon is 15°

Work out the number of sides of the polygon.

.....
(Total for Question 28 is 2 marks)

29 Write down the gradient of the line with equation $y = 2x + 3$

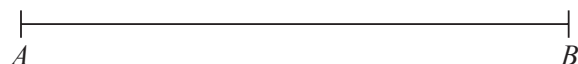
.....
(Total for Question 29 is 1 mark)

TOTAL FOR PAPER IS 80 MARKS



5 AB is a straight line.

Mark with a cross (X) the midpoint of AB .



(Total for Question 5 is 1 mark)

6 (a) Simplify $a \times b \times 4$

.....
(1)

(b) Simplify $4x + 3 - x + 5$

.....
(2)

(Total for Question 6 is 3 marks)

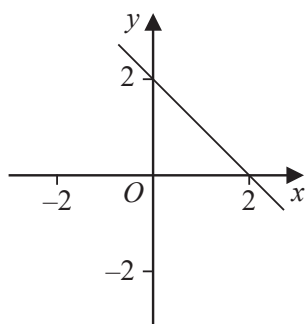
- 26 The equation of the line L_1 is $y = 3x - 2$
The equation of the line L_2 is $3y - 9x + 5 = 0$

Show that these two lines are parallel.

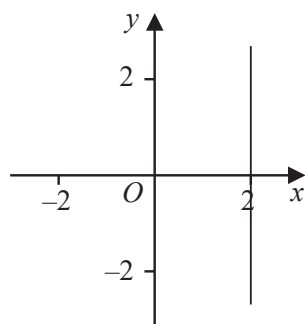
(Total for Question 26 is 2 marks)



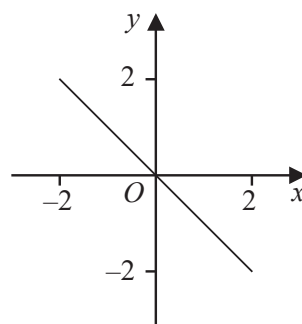
13 Here are six straight line graphs.



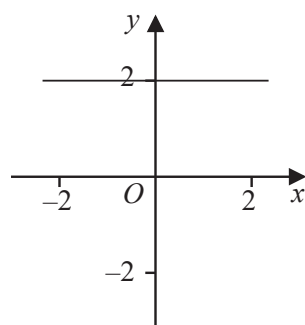
Graph A



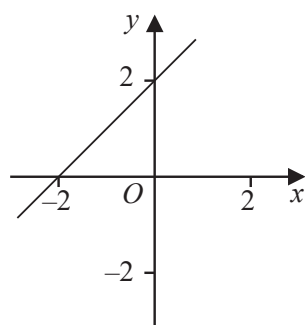
Graph B



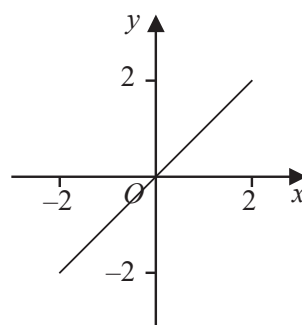
Graph C



Graph D



Graph E



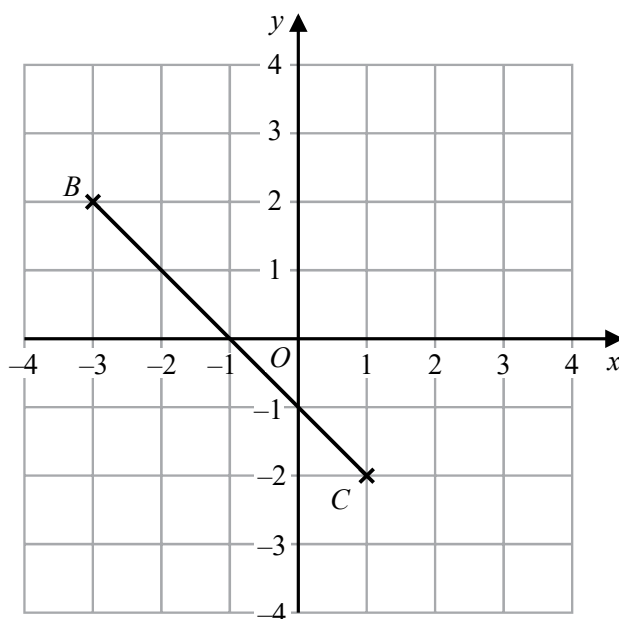
Graph F

Match each equation in the table to the correct graph.
Write the letter of the graph in the table.

Equation	Graph
$y = 2$	
$y = x$	
$x + y = 2$	

(Total for Question 13 is 2 marks)

10



- (a) Plot the point with coordinates (3, 2)
Label this point *A*.

(1)

- (b) Write down the coordinates of the midpoint of *BC*.

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

(Total for Question 10 is 2 marks)

- 11 Mason throws a coin 3 times.
The outcome of each throw is either Heads or Tails.
List all the possible outcomes of the 3 throws.

.....
.....
.....

(Total for Question 11 is 2 marks)



28 The equation of a straight line **L** is $y = 3 - 4x$

(i) Write down the gradient of **L**.

.....
(1)

(ii) Write down the coordinates of the point where **L** crosses the y -axis.

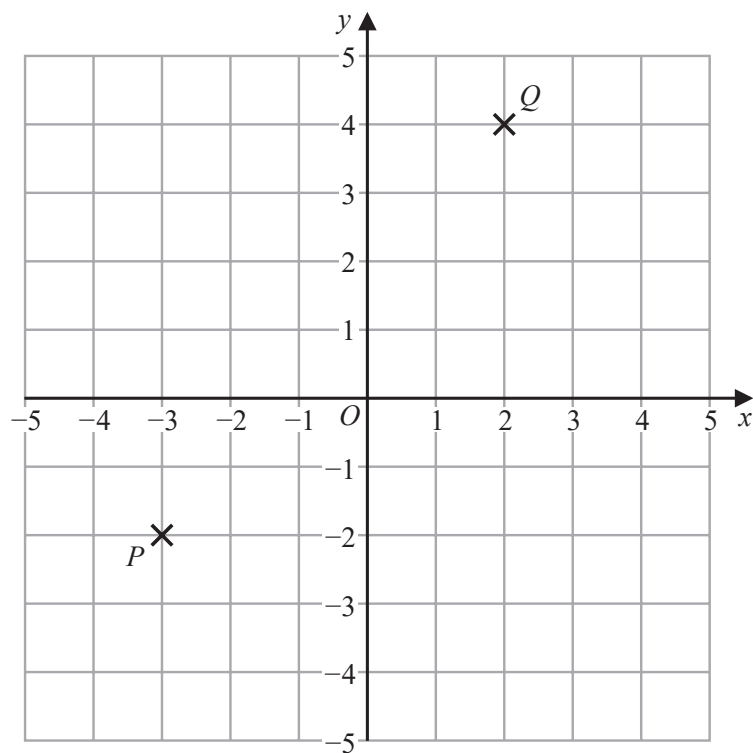
(..... , ...)
(1)

(Total for Question 28 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS



15



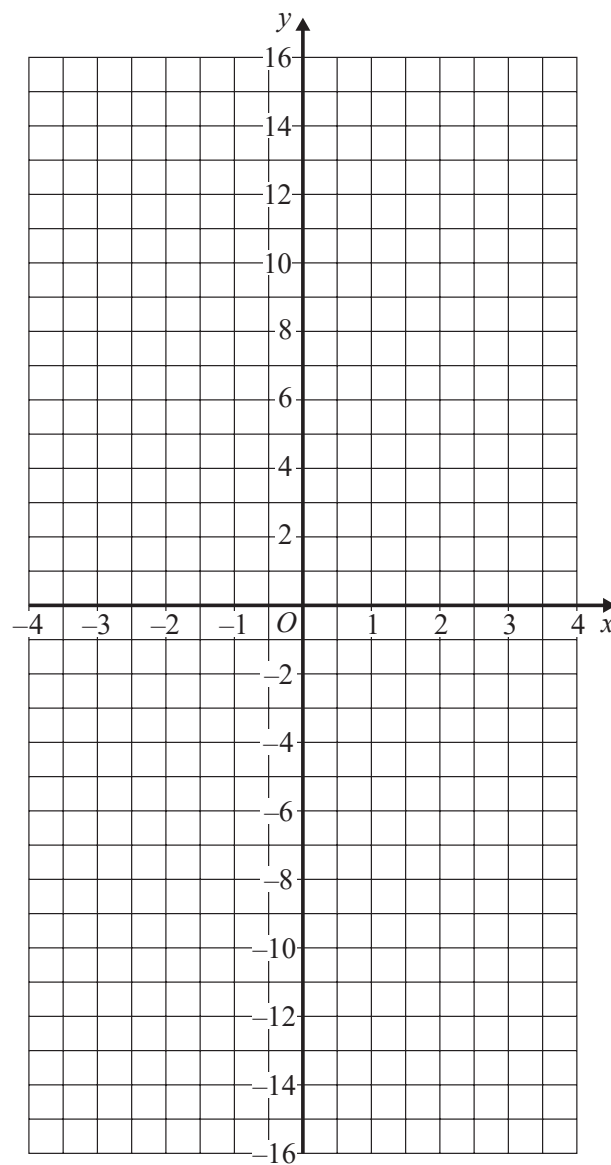
Find the coordinates of the midpoint of PQ .

(..... , ...)

(Total for Question 15 is 2 marks)



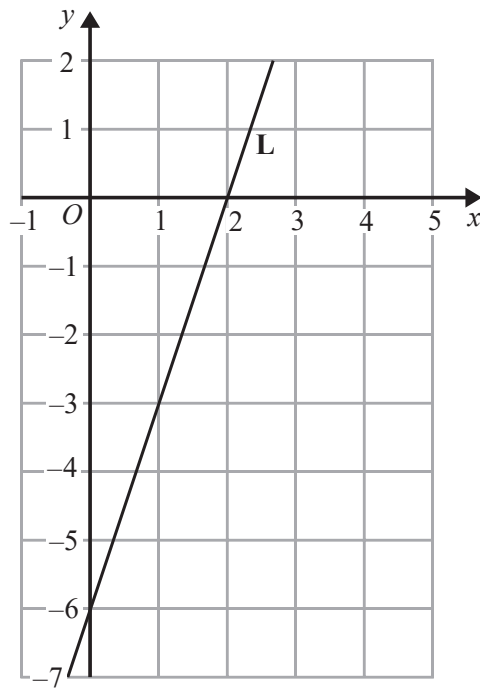
25 On the grid below, draw the graph of $y = 1 - 4x$ for values of x from -3 to 3



(Total for Question 25 is 3 marks)



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

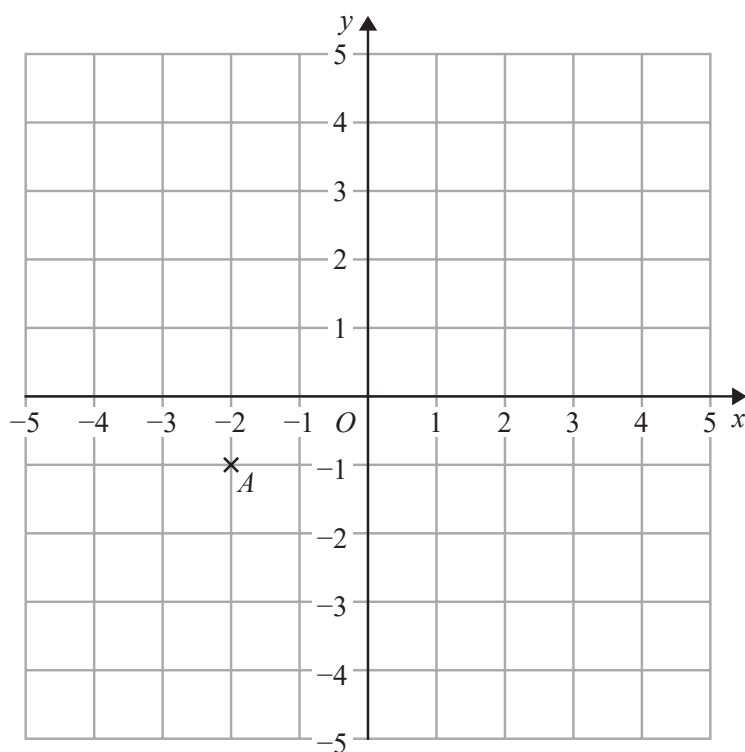


Find an equation for **L**.

(Total for Question 22 is 3 marks)



8



- (a) Write down the coordinates of point A .

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

- (b) On the grid, mark with a cross (x) the point (2, 3)
Label this point B .

(1)

- (c) On the grid, draw the line with equation $x = -4$

(1)

(Total for Question 8 is 3 marks)



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

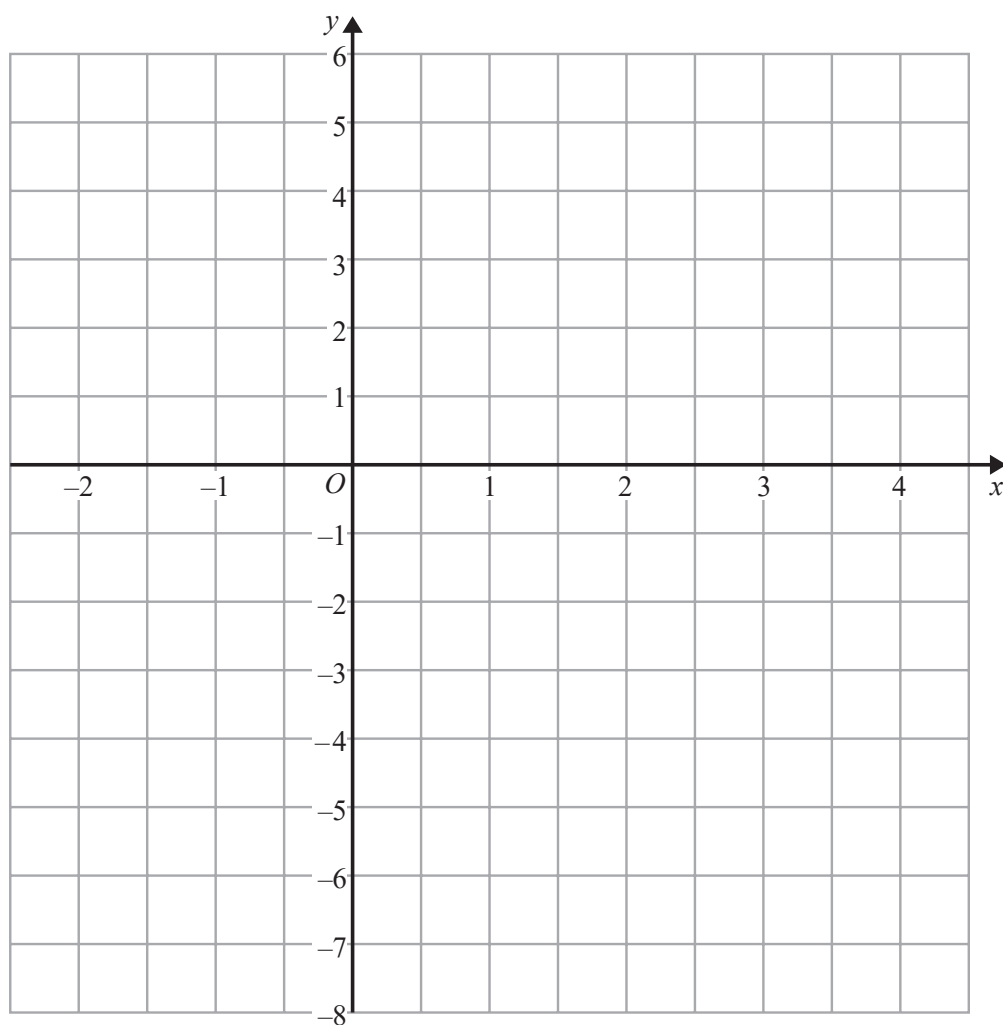
The gradient of the line AB is 3

Work out the value of d .

(Total for Question 25 is 3 marks)



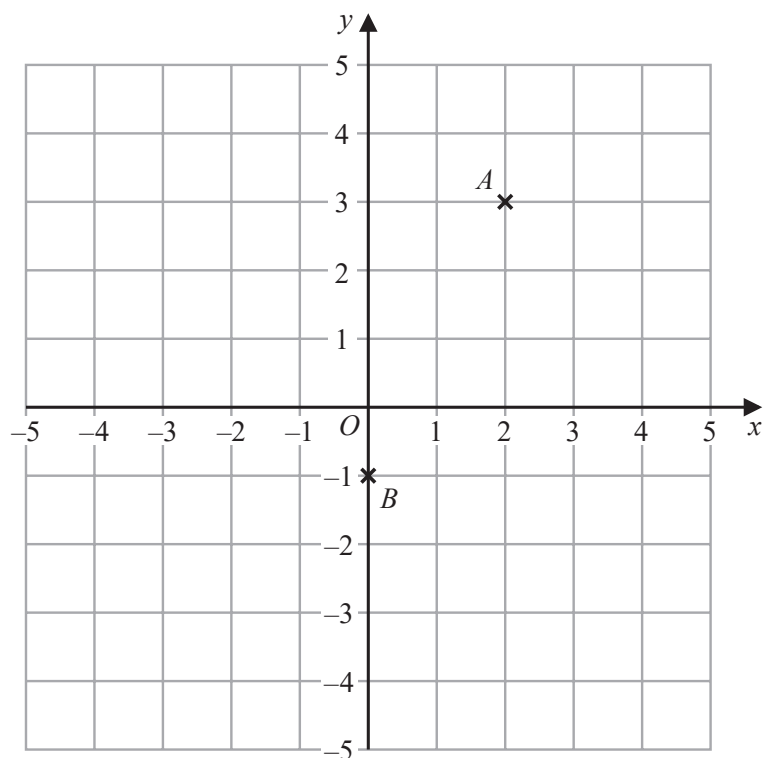
21 On the grid below, draw the graph of $y = 2x - 3$ for values of x from -2 to 4



(Total for Question 21 is 3 marks)



8



(a) Write down the coordinates of the point A .

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

(b) Write down the coordinates of the point B .

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

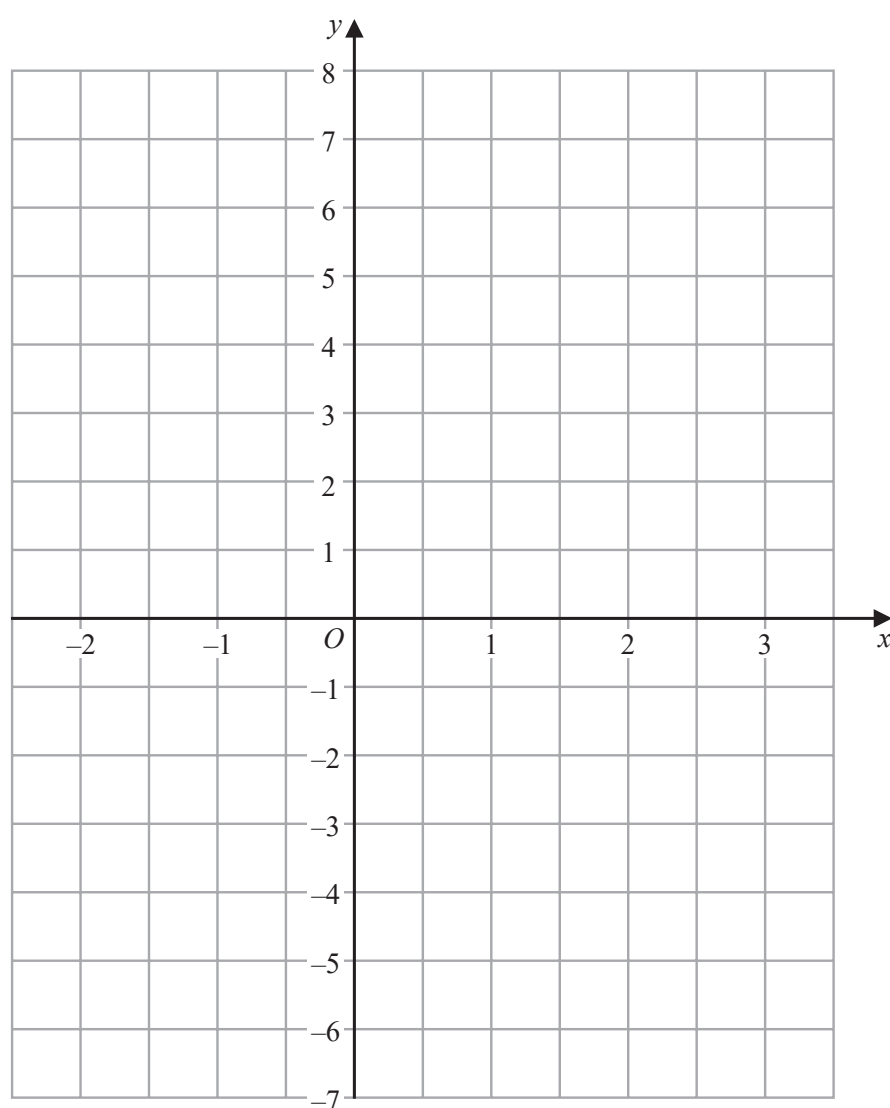
(c) On the grid, mark with a cross (X) the point $(-2, 1)$
Label this point C .

(1)

(Total for Question 8 is 3 marks)



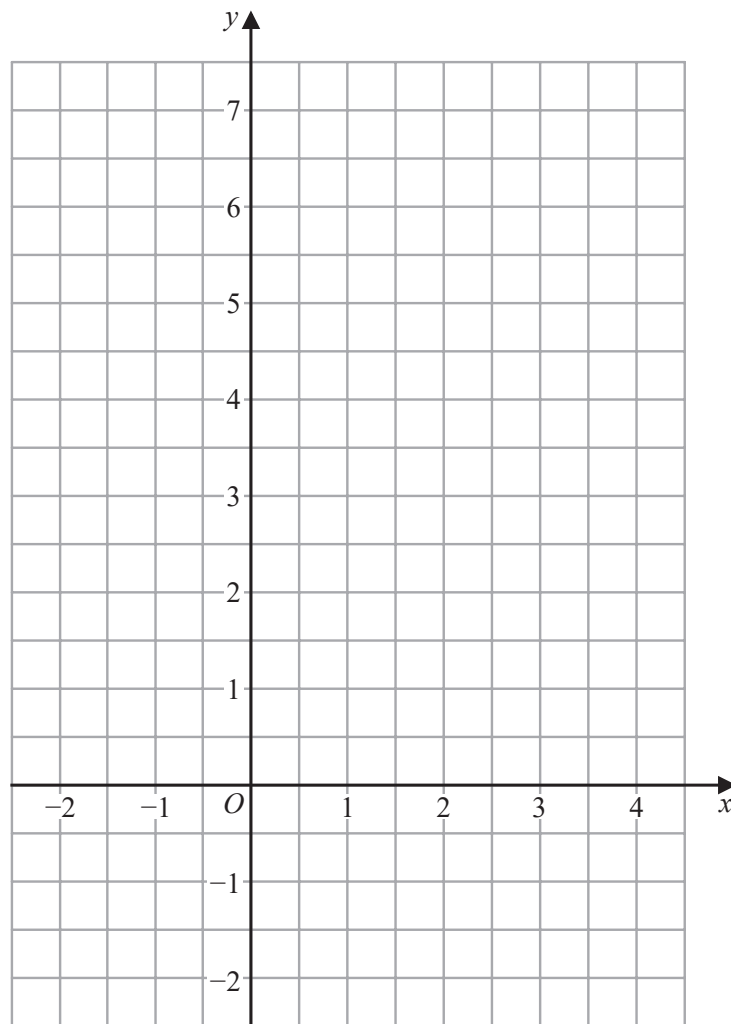
18 On the grid below, draw the graph of $y = 2x - 2$ for values of x from -2 to 3



(Total for Question 18 is 3 marks)



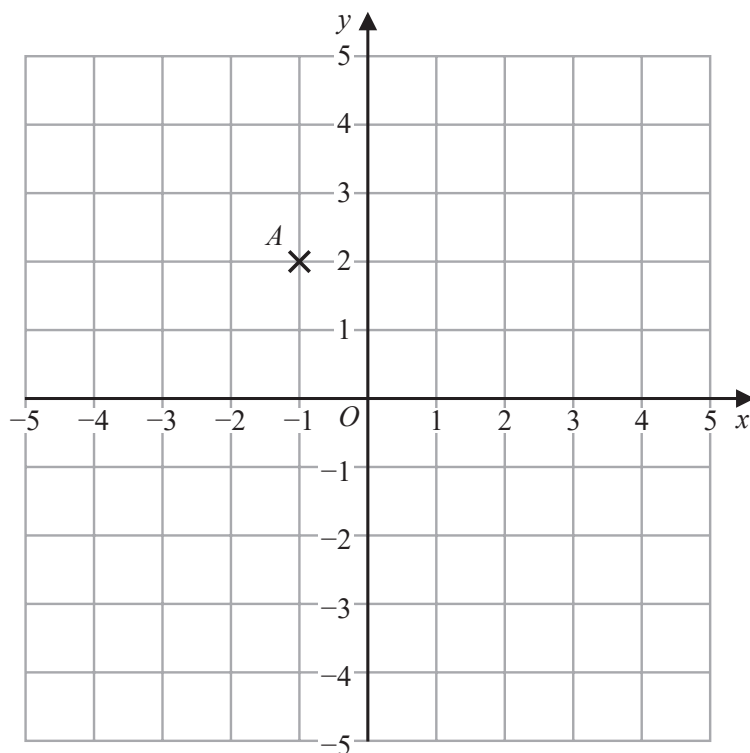
17 On the grid below, draw the graph of $y = 4 - x$ for values of x from -2 to 4



(Total for Question 17 is 3 marks)



9



- (a) Write down the coordinates of point A .

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

- (b) On the grid, mark with a cross ($\times$) the point $(1, 4)$
Label this point B .

(1)

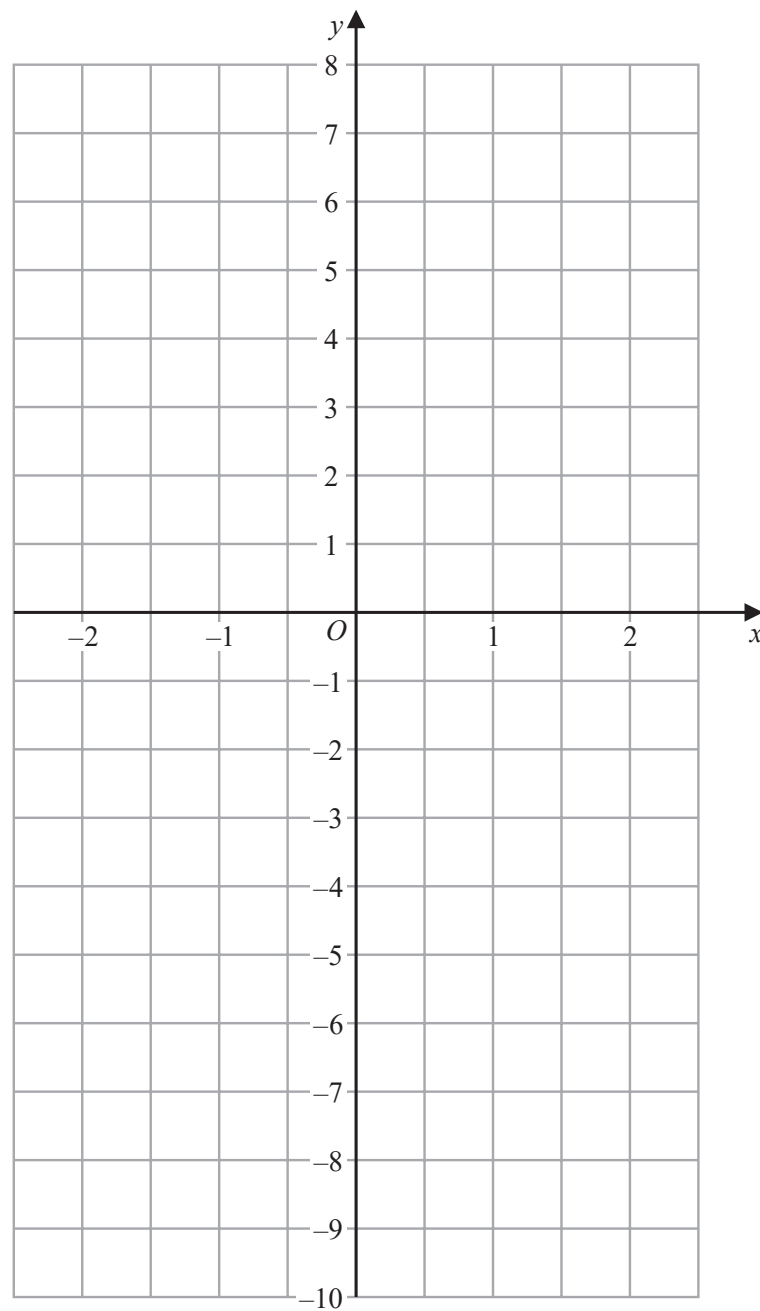
- (c) On the grid, draw the line with equation $y = -3$

(1)

(Total for Question 9 is 3 marks)



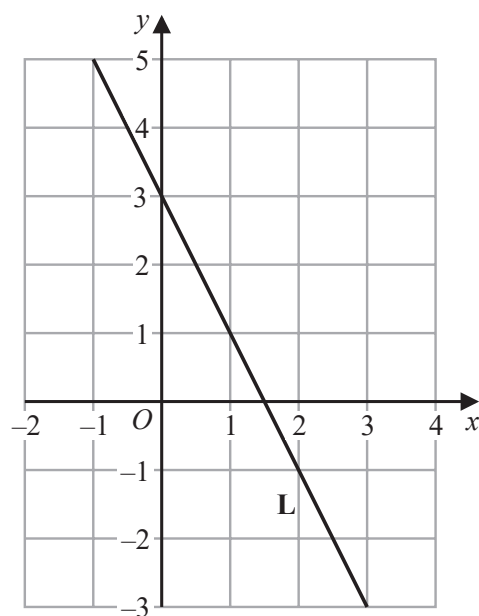
14 On the grid, draw the graph of $y = 4x - 1$ for values of x from -2 to 2



(Total for Question 14 is 3 marks)



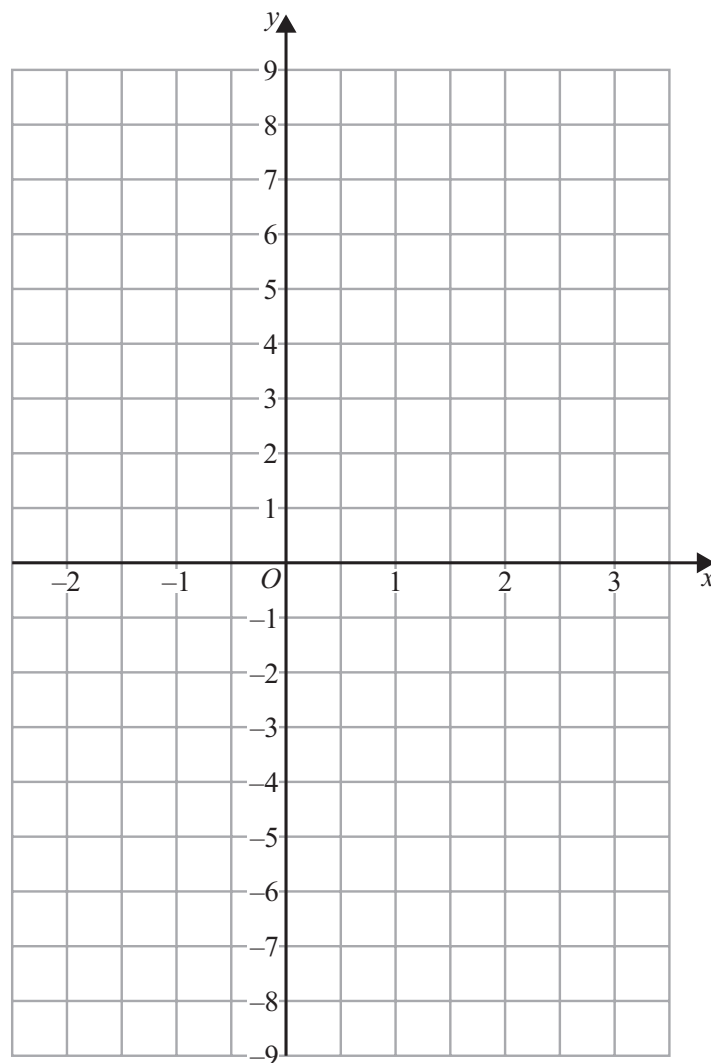
28 The line **L** is shown on the grid.



Find an equation for **L**.

(Total for Question 28 is 3 marks)

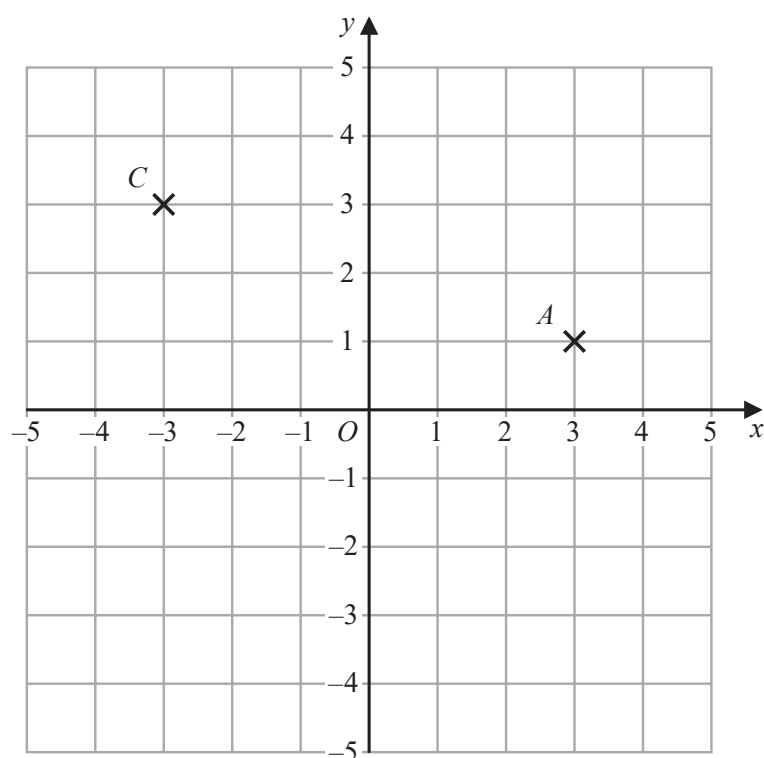
19 On the grid below, draw the graph of $y = 3x - 2$ for values of x from -2 to 3



(Total for Question 19 is 3 marks)



8



(a) Write down the coordinates of point A .

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

(b) On the grid, mark with a cross ($\times$) the point $(3, -4)$
Label this point B .

(1)

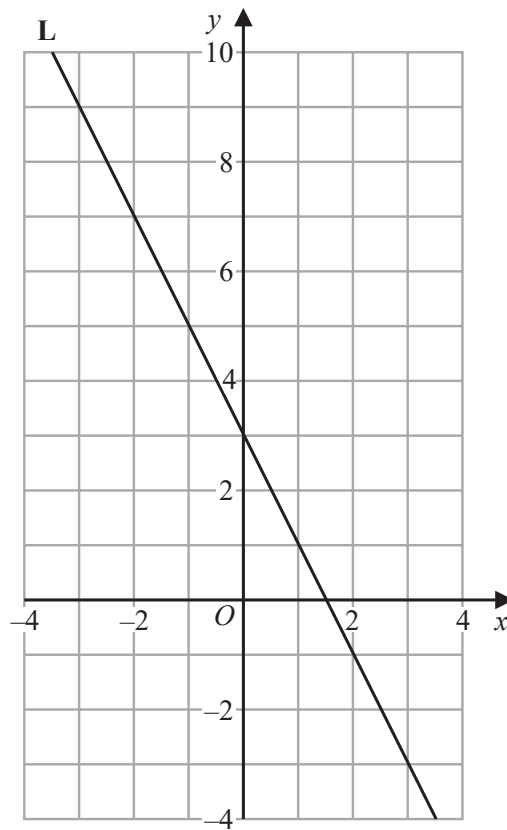
(c) Write down the coordinates of the midpoint of AC .

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

(Total for Question 8 is 3 marks)



27 Line **L** is drawn on the grid.



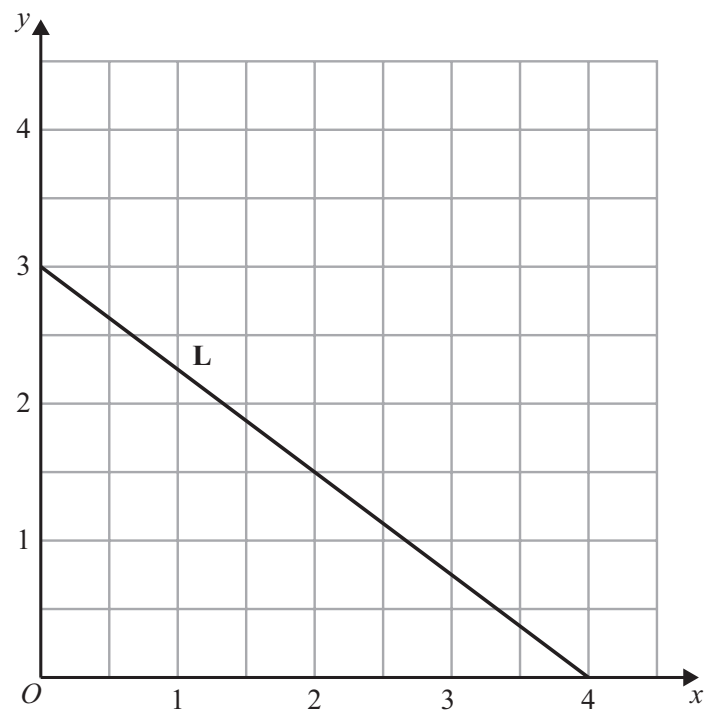
Find an equation for line **L**.

(Total for Question 27 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS



25 The straight line **L** is shown on the grid.



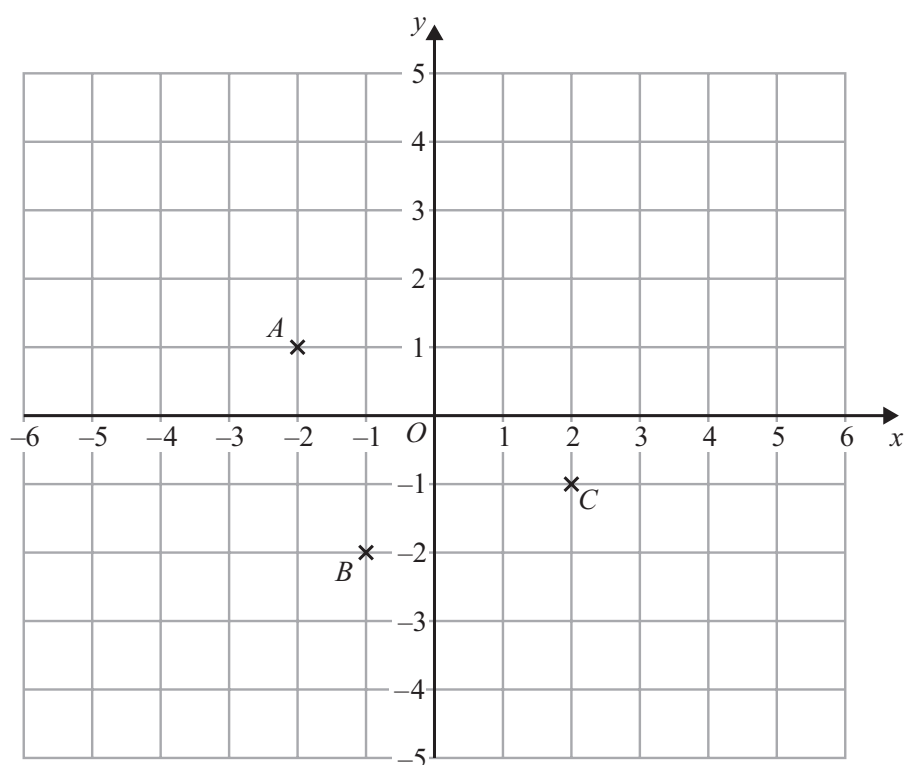
Find an equation for **L**.

Give your answer in the form $y = mx + c$

(Total for Question 25 is 3 marks)

Turn over for Question 26

9



- (a) Write down the coordinates of point A .

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

- (b) On the grid, mark with a cross ($\times$) the point D so that $ABCD$ is a square.
Label this point D .

(1)

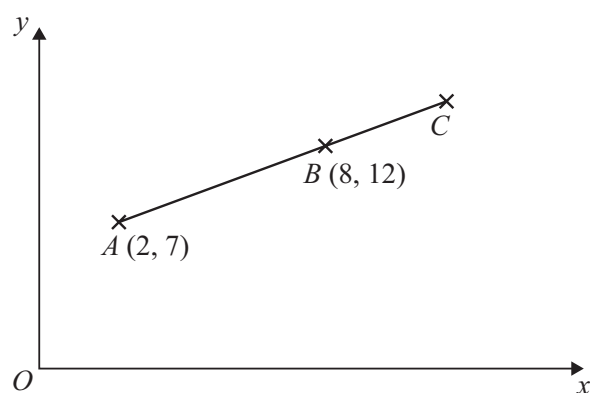
- (c) On the grid, mark with a cross ($\times$) the point E so that C is the midpoint of BE .
Label this point E .

(1)

(Total for Question 9 is 3 marks)



28 ABC is a straight line.



Point A has coordinates $(2, 7)$

Point B has coordinates $(8, 12)$

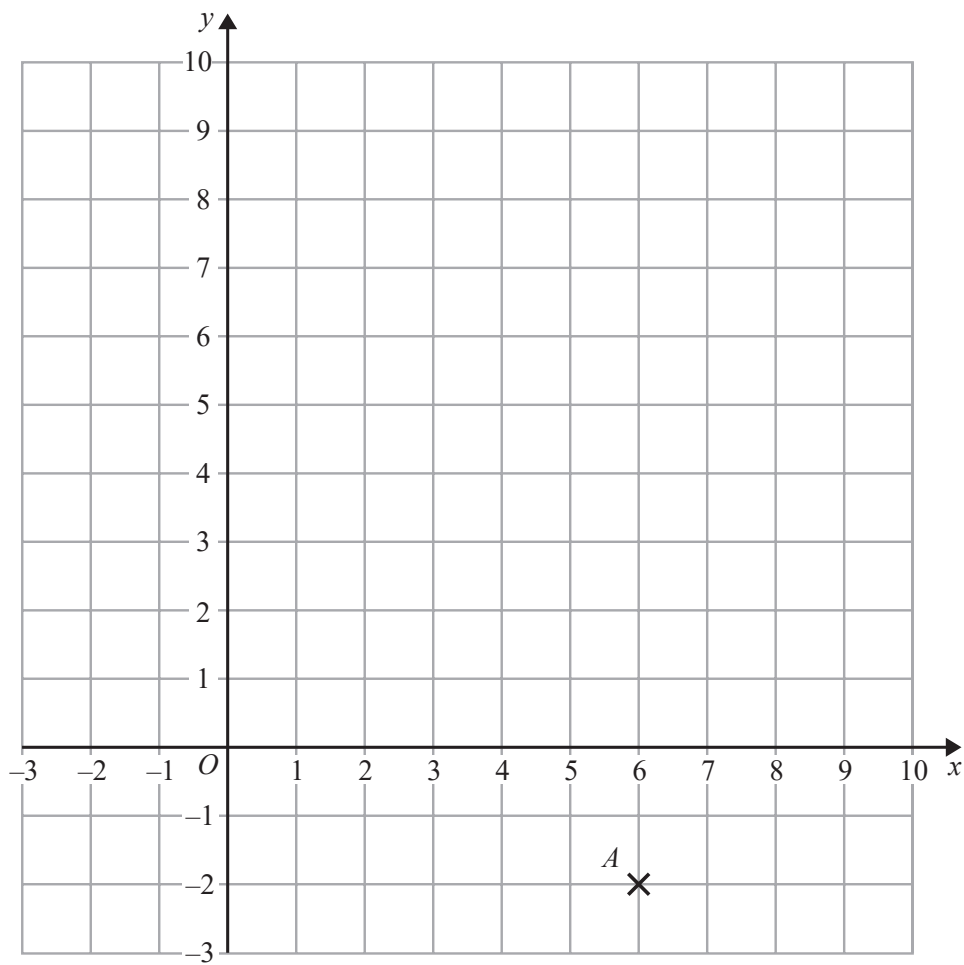
$$BC = \frac{1}{2} AB$$

Find the coordinates of point C .

(....., ...)

(Total for Question 28 is 3 marks)

7



(a) Write down the coordinates of the point A .

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

- (b) (i) Plot the point with coordinates $(2, 9)$.
Label this point B .

(1)

- (ii) Does point B lie on the straight line with equation $y = 4x + 1$?
You must show how you get your answer.

(1)

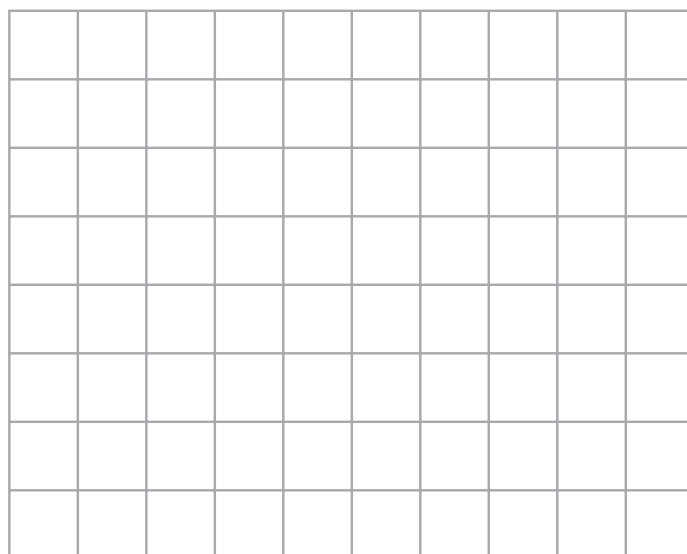
- (c) On the grid, draw the line with equation $x = -2$

(1)

(Total for Question 7 is 4 marks)

- 8 The length of a rectangle is twice as long as the width of the rectangle.
The area of the rectangle is 32 cm^2 .

Draw the rectangle on the centimetre grid.



(Total for Question 8 is 2 marks)

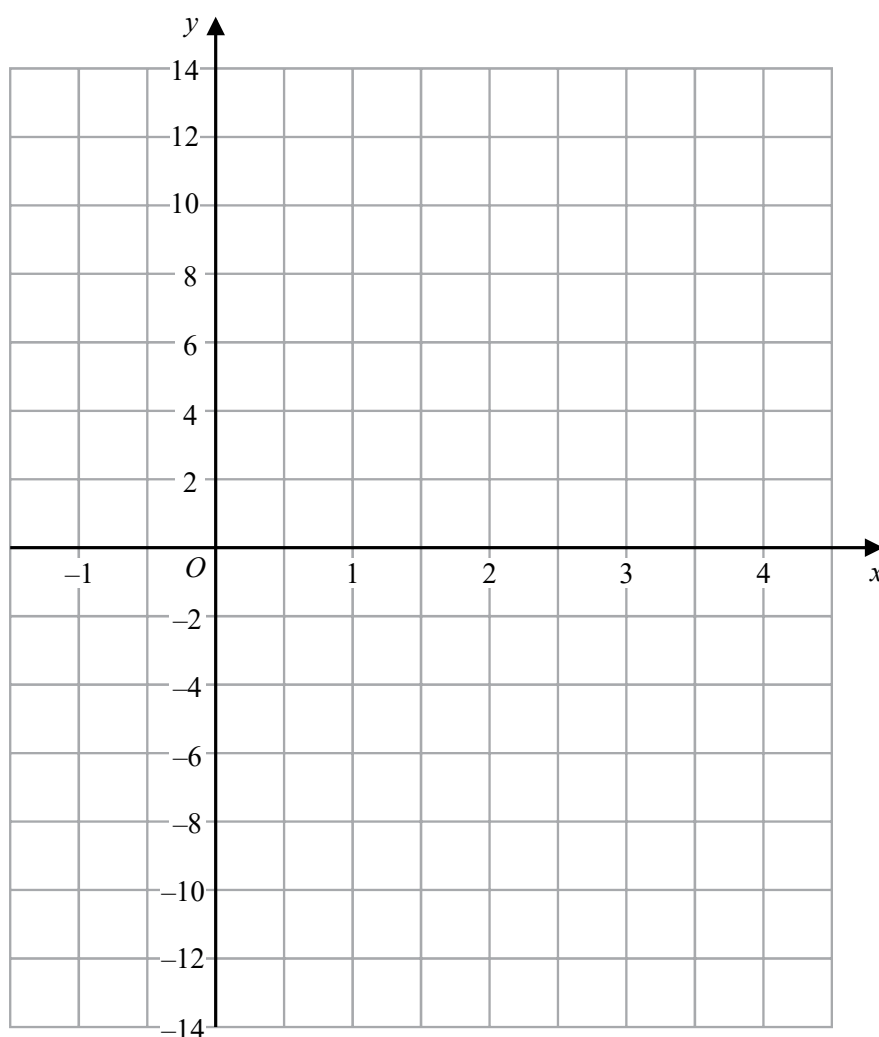


17 (a) Complete the table of values for $y = 4x - 6$

x	-1	0	1	2	3	4
y			-2			10

(2)

(b) On the grid, draw the graph of $y = 4x - 6$ for values of x from -1 to 4

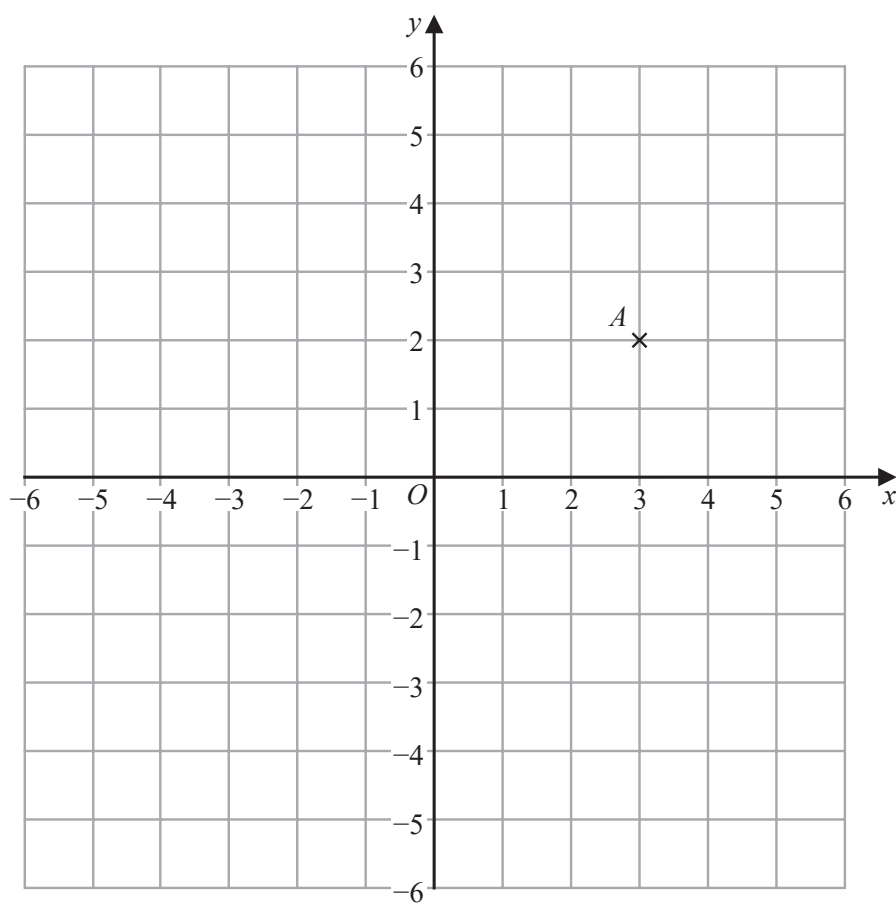


(2)

(Total for Question 17 is 4 marks)



8 Here is a centimetre grid.



(a) Write down the coordinates of point A .

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

(b) On the grid, mark with a cross (x) the point with coordinates $(-4, 3)$
Label this point B .

(1)

(c) On the grid, draw the circle with
centre $(1, -1)$
and radius 4 cm.

(2)

(Total for Question 8 is 4 marks)



25 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 .

(....., ...)

(Total for Question 25 is 4 marks)

26 A new phone cost £679

The value of the phone decreases at a rate of 4% per year.

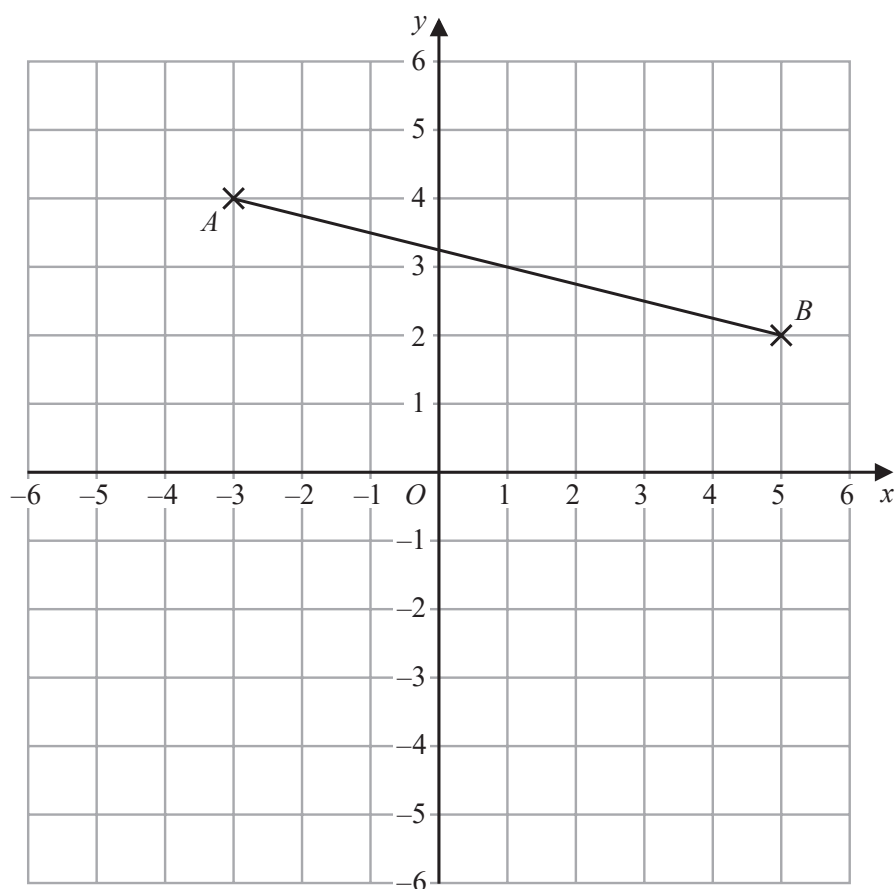
Work out the value of the phone at the end of 3 years.

£.....

(Total for Question 26 is 3 marks)



9



(a) Write down the coordinates of point B .

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

(b) Plot the point with coordinates $(4, -2)$
Label this point C .

(1)

(c) Write down the coordinates of the midpoint of AB .

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

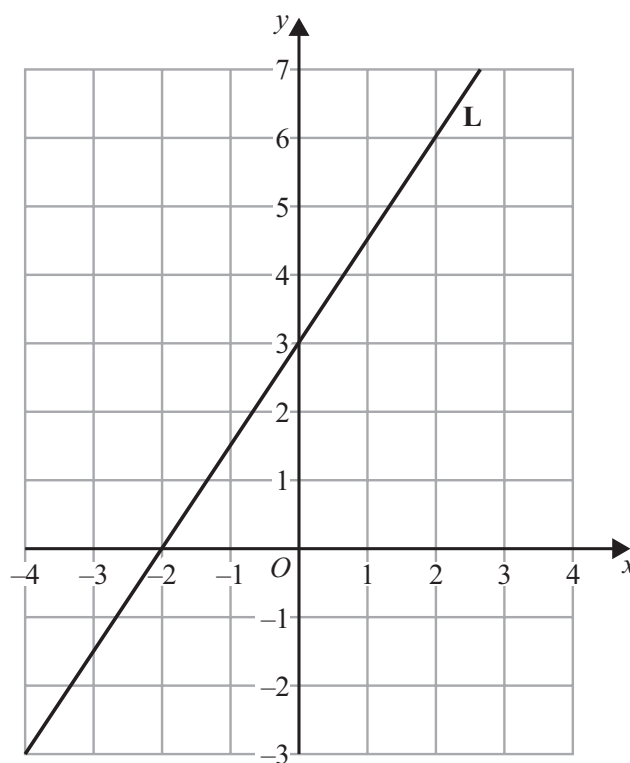
(d) Draw the line with equation $y = -4$

(1)

(Total for Question 9 is 4 marks)



25 Here is a straight line **L** drawn on a grid.



(a) Find an equation for **L**.

.....
(3)

M is a different straight line with equation $y = 5x$

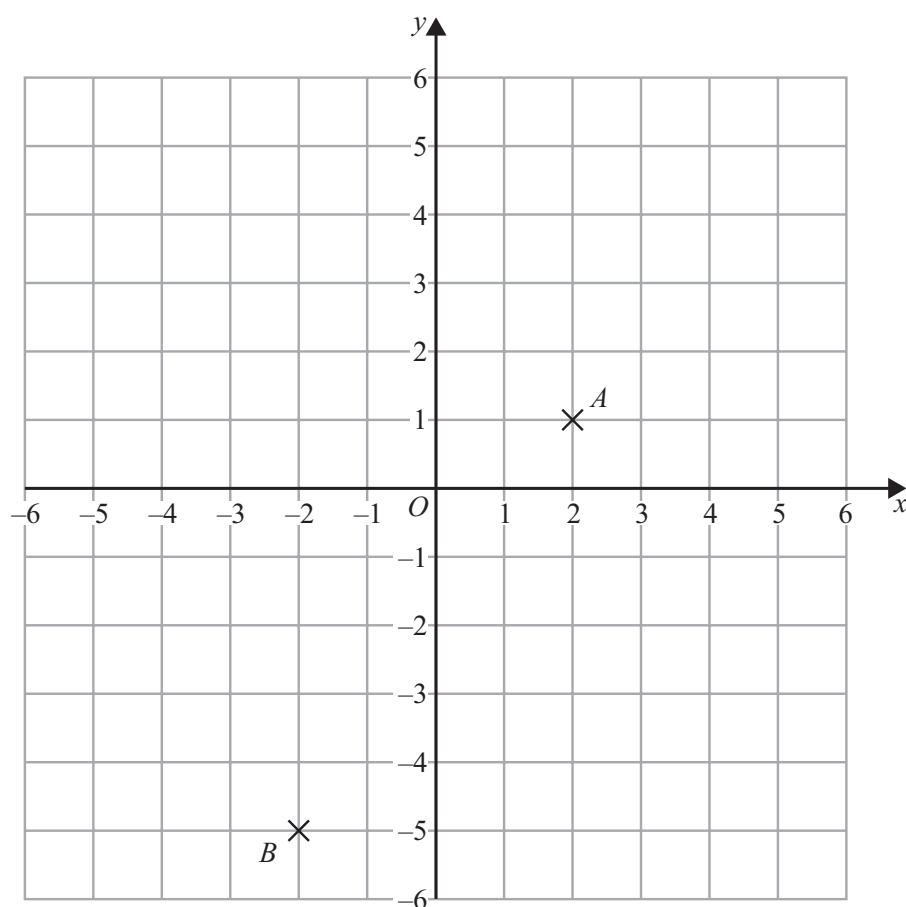
(b) Write down the equation of a straight line parallel to **M**.

.....
(1)

(Total for Question 25 is 4 marks)



8 The points A and B are shown on the grid.



(a) Write down the coordinates of the point A .

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

(b) Find the coordinates of the midpoint of AB .

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

(c) On the grid, mark with a cross ($\times$) the point with coordinates $(-4, 2)$
Label this point C .

(1)

(Total for Question 8 is 4 marks)

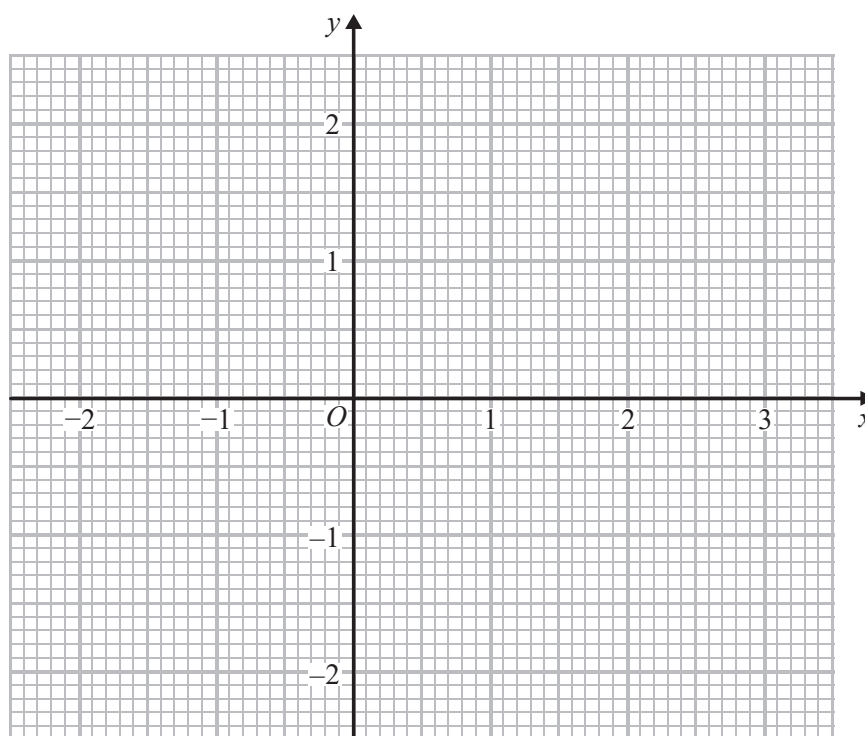


13 (a) Complete the table of values for $y = \frac{1}{2}x - 1$

x	-2	-1	0	1	2	3
y	-2				0	

(2)

(b) On the grid, draw the graph of $y = \frac{1}{2}x - 1$ for values of x from -2 to 3



(2)

(c) Use your graph to find the value of x when $y = 0.3$

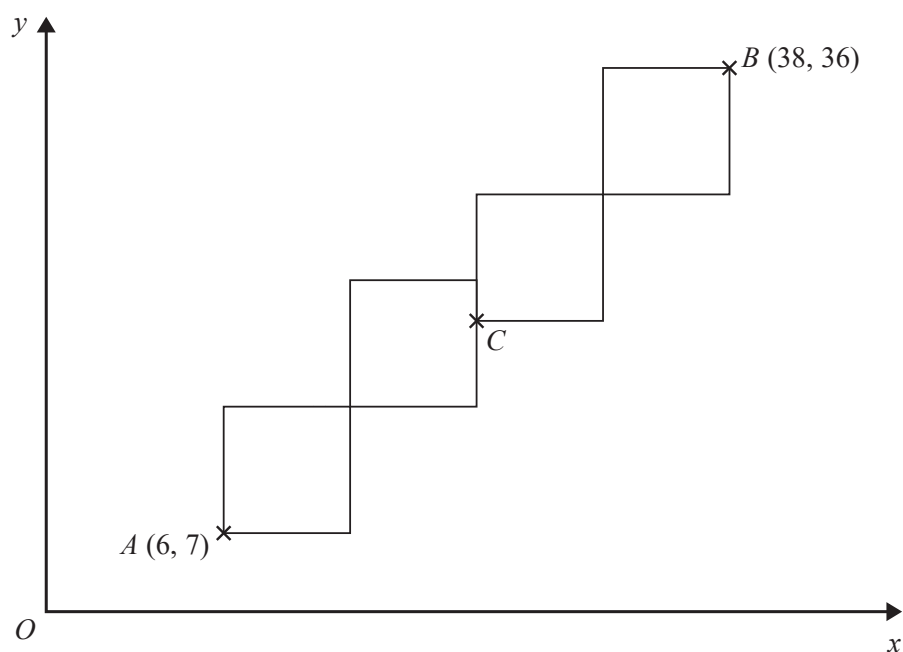
$x = \dots\dots\dots$

(1)

(Total for Question 13 is 5 marks)



- 24 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 24 is 5 marks)

SUB-TOPIC A4b

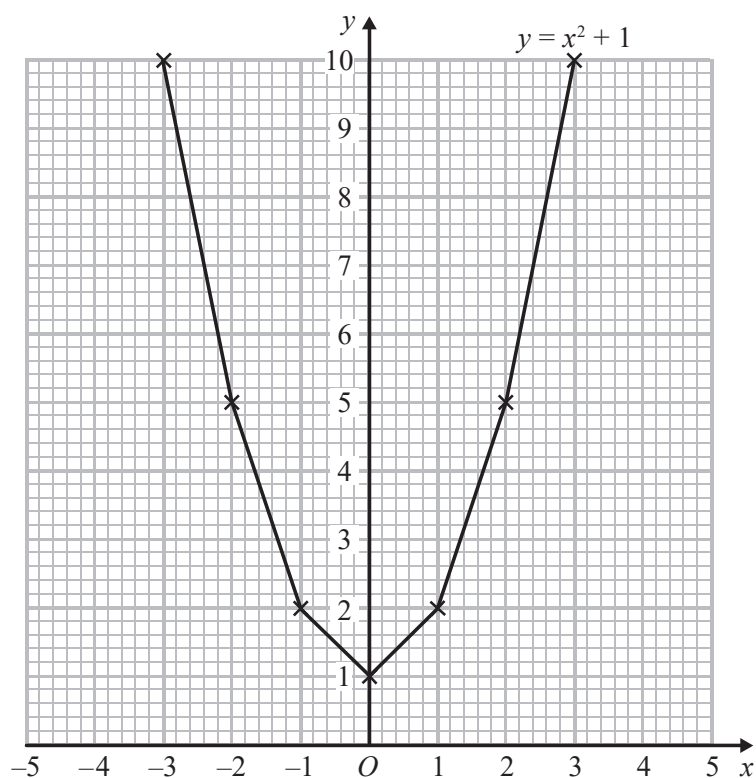
QUADRATIC & OTHER GRAPHS

Sub-topic A4b · 19 questions · 71 marks · lowest tariff first



29 Brogan needs to draw the graph of $y = x^2 + 1$

Here is her graph.



Write down one thing that is wrong with Brogan's graph.

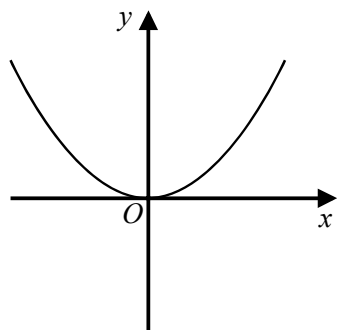
.....

.....

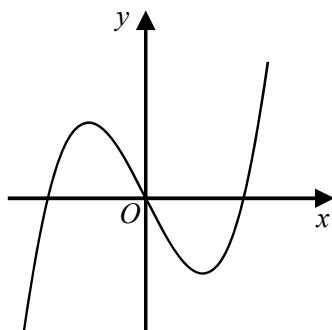
(Total for Question 29 is 1 mark)

25 Here are six graphs.

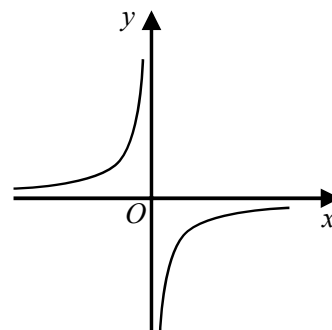
A



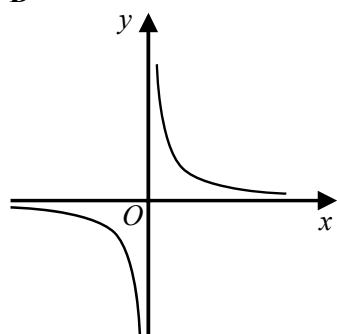
B



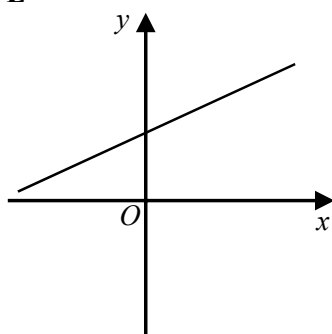
C



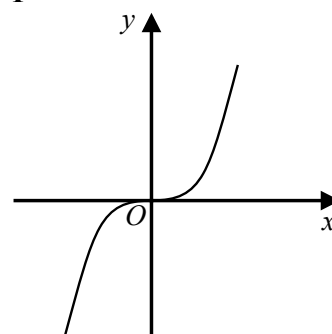
D



E



F



Write down the letter of the graph that could have the equation

(a) $y = x^3$

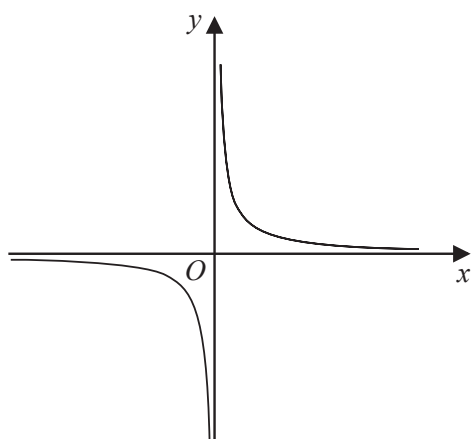
.....
(1)

(b) $y = \frac{1}{x}$

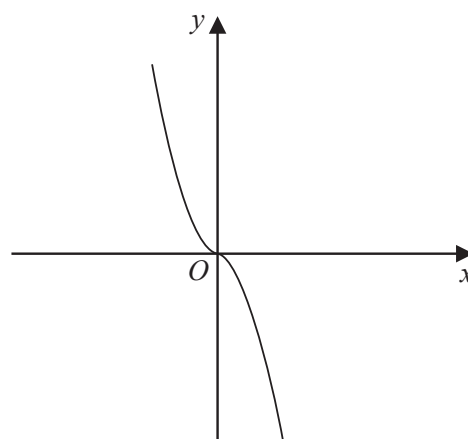
.....
(1)

(Total for Question 25 is 2 marks)

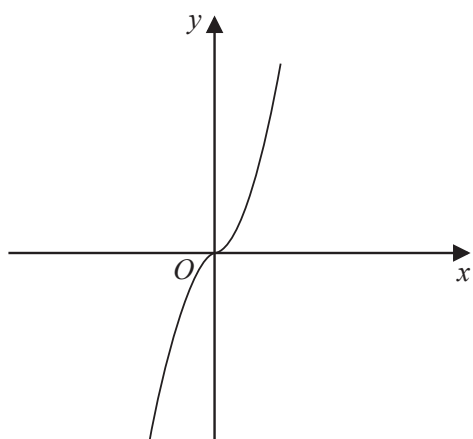
22 The diagram shows four graphs.



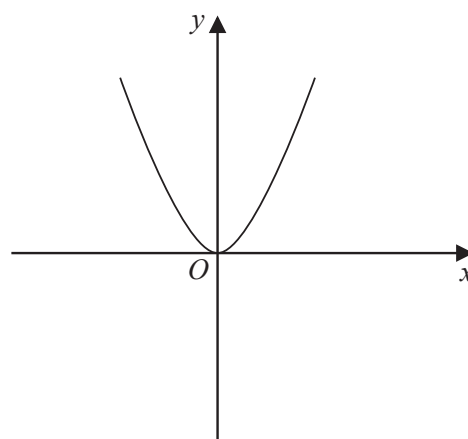
Graph A



Graph B



Graph C



Graph D

Each of the equations in the table is the equation of one of the graphs.

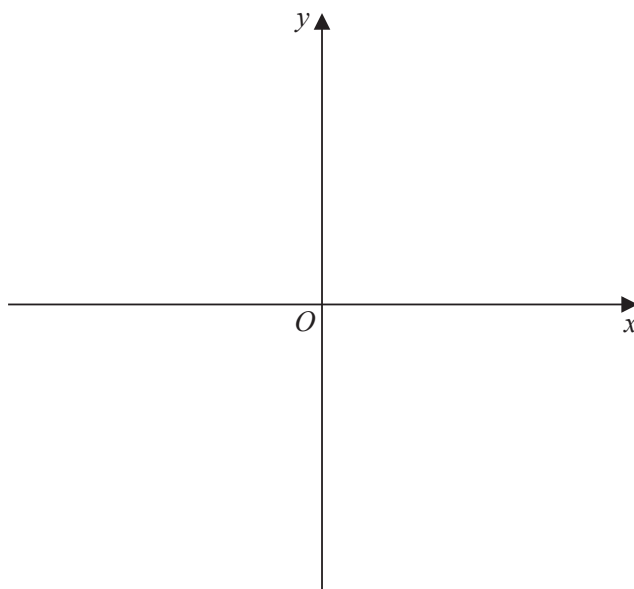
Complete the table.

Equation	Letter of graph
$y = -x^3$	
$y = x^3$	
$y = x^2$	
$y = \frac{1}{x}$	

(Total for Question 22 is 2 marks)



28 Sketch the graph of $y = \frac{1}{x}$

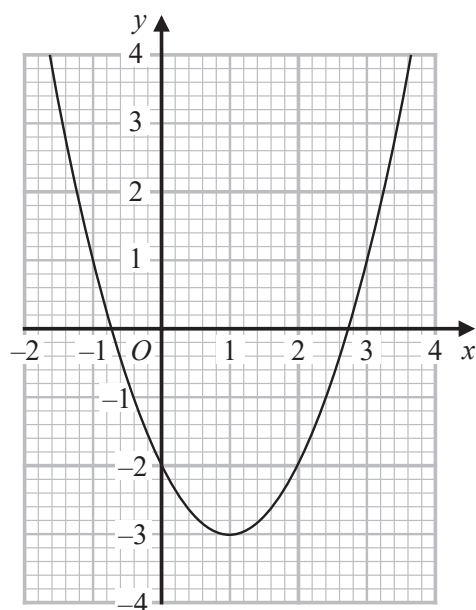


(Total for Question 28 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS



26 Here is the graph of $y = x^2 - 2x - 2$



(a) Write down the coordinates of the turning point on the graph of $y = x^2 - 2x - 2$

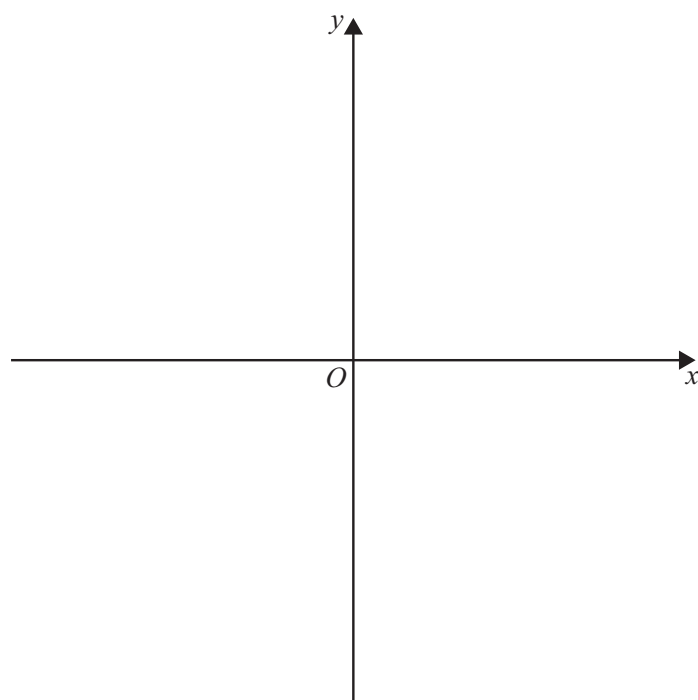
(....., ...)
(1)

(b) Write down an estimate for one of the roots of $x^2 - 2x - 2 = 0$

.....
(1)

(Total for Question 26 is 2 marks)

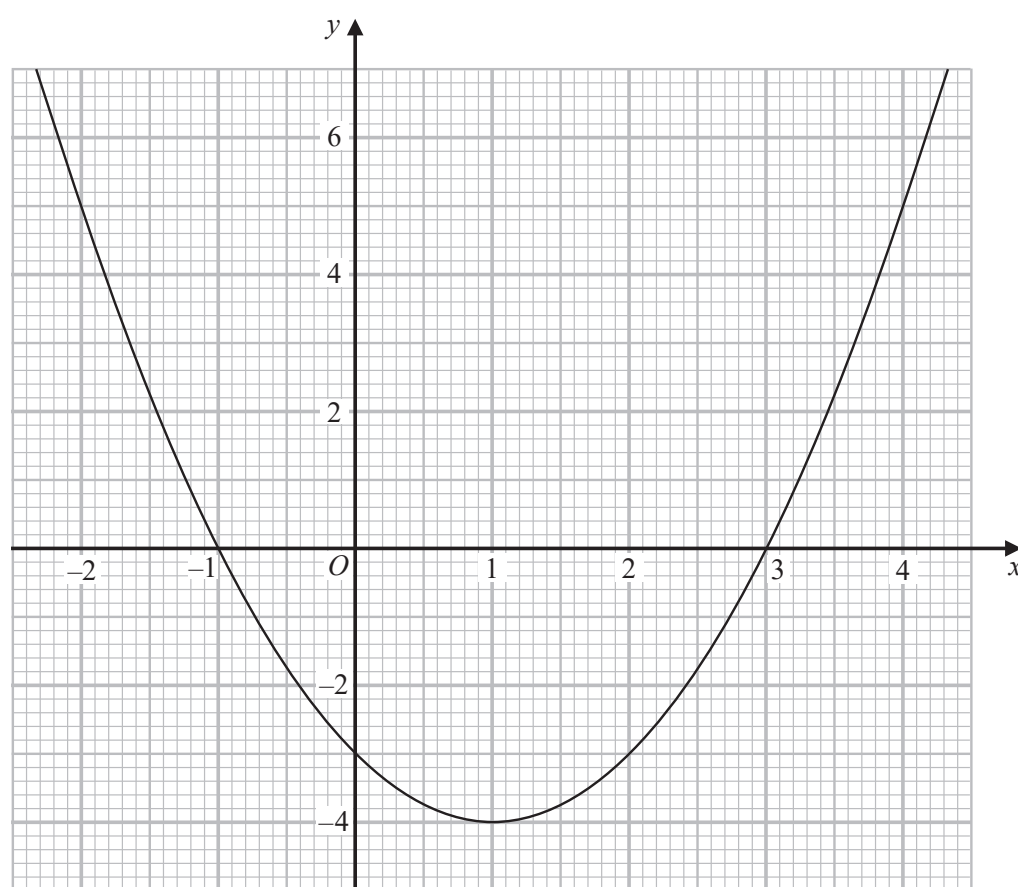
28 Sketch the graph of $y = x^2 + 2$



(Total for Question 28 is 2 marks)



29 Here is the graph of $y = x^2 - 2x - 3$



(a) Write down the coordinates of the turning point on the graph of $y = x^2 - 2x - 3$

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

(b) Use the graph to find the roots of the equation $x^2 - 2x - 3 = 0$

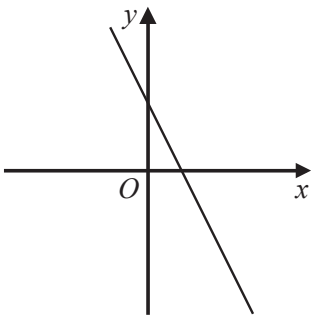
.....
(2)

(Total for Question 29 is 3 marks)

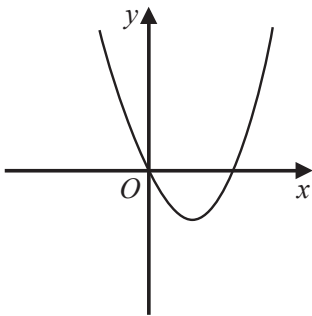
TOTAL FOR PAPER IS 80 MARKS



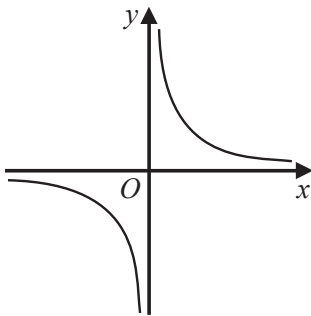
28 Here are five graphs.



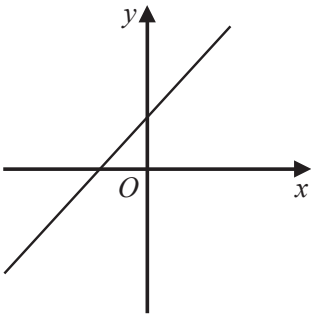
A



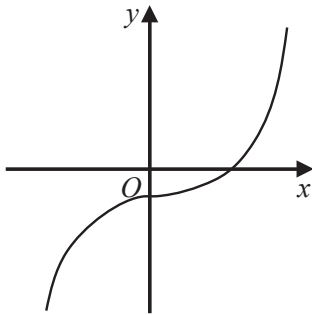
B



C



D



E

The table shows the equations of these graphs.

Equation	Graph
$y = x^2 - 4x$	
$y = x + 3$	
$y = x^3 - 2$	
$y = \frac{1}{x}$	
$y = 5 - 2x$	

Match the letter of each graph with its equation.

(Total for Question 28 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

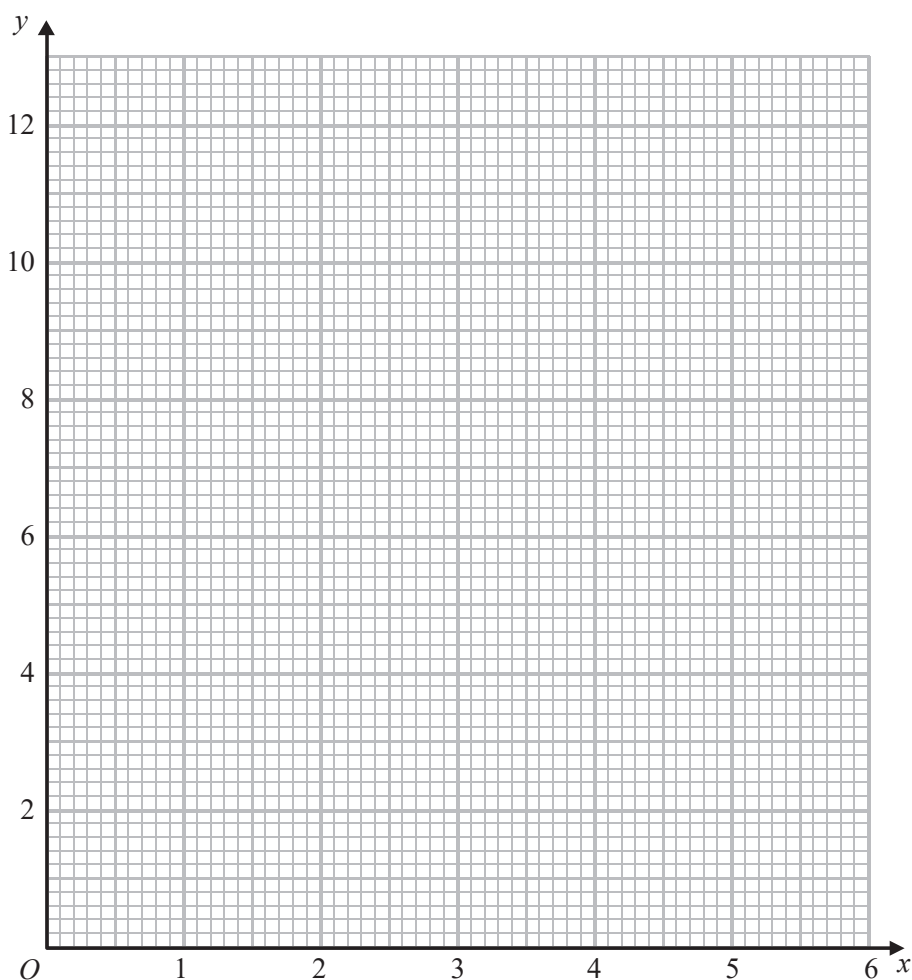


22 (a) Complete the table of values for $y = \frac{6}{x}$

x	0.5	1	1.5	2	3	4	5	6
y		6		3		1.5		

(2)

(b) On the grid below, draw the graph of $y = \frac{6}{x}$ for values of x from 0.5 to 6



(2)

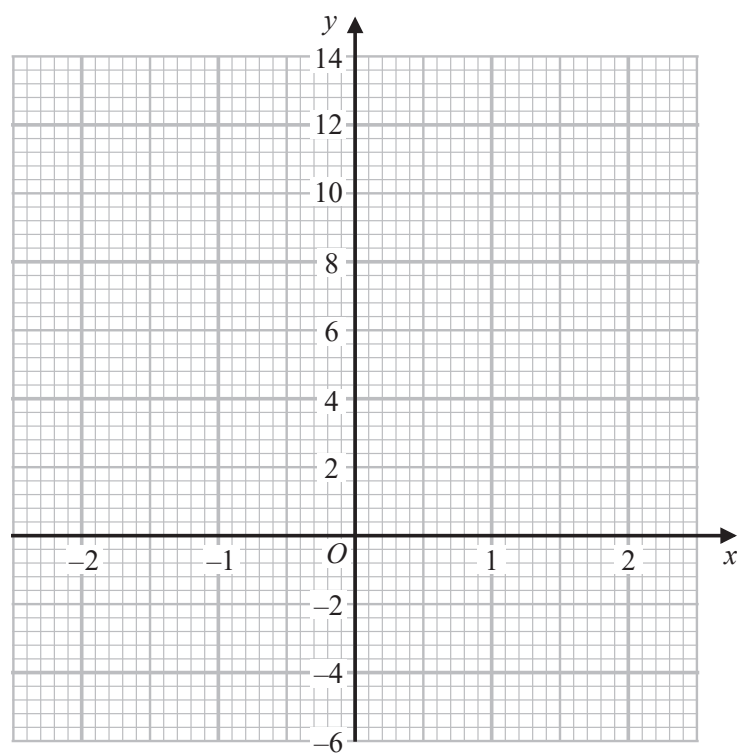
(Total for Question 22 is 4 marks)

24 (a) Complete the table of values for $y = 5 - x^3$

x	-2	-1	0	1	2
y		6			

(2)

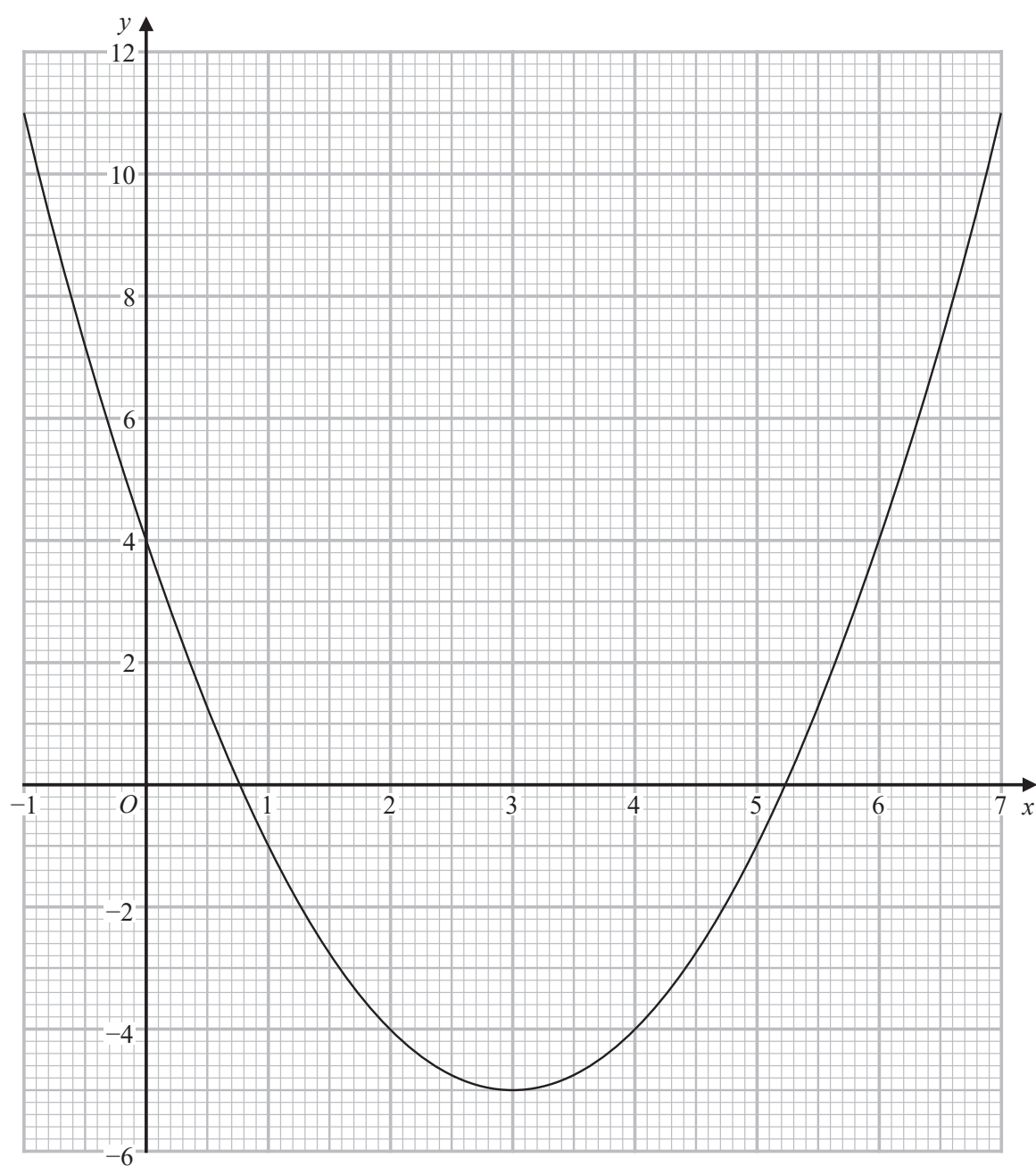
(b) On the grid below, draw the graph of $y = 5 - x^3$ for values of x from -2 to 2



(2)

(Total for Question 24 is 4 marks)

24 Here is the graph of $y = x^2 - 6x + 4$



(a) Write down the y intercept of the graph of $y = x^2 - 6x + 4$

.....
(1)

(b) Write down the coordinates of the turning point of the graph of $y = x^2 - 6x + 4$

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

(c) Use the graph to find estimates for the roots of $x^2 - 6x + 4 = 0$

.....
(2)

(Total for Question 24 is 4 marks)

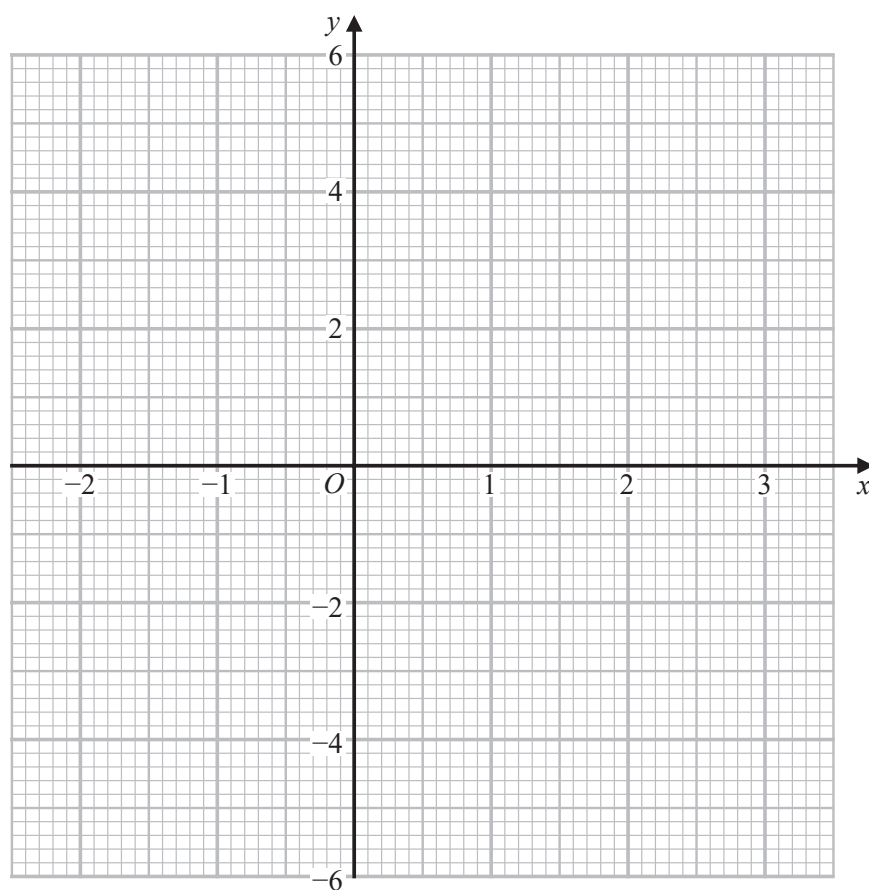


20 (a) Complete the table of values for $y = x^2 - x - 2$

x	-2	-1	0	1	2	3
y	4			-2		

(2)

(b) On the grid, draw the graph of $y = x^2 - x - 2$ for values of x from -2 to 3



(2)

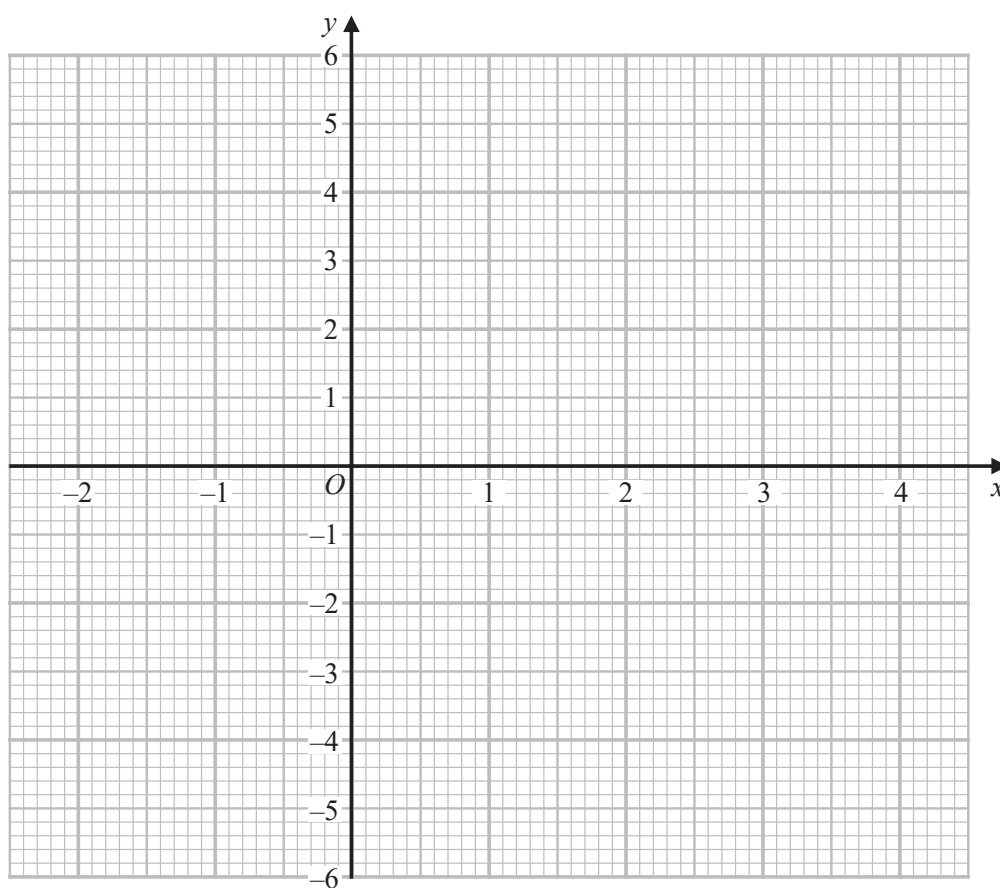
(Total for Question 20 is 4 marks)

24 (a) Complete the table of values for $y = x^2 - 2x - 3$

x	-2	-1	0	1	2	3	4
y		0			-3		

(2)

(b) On the grid, draw the graph of $y = x^2 - 2x - 3$ for values of x from -2 to 4



(2)

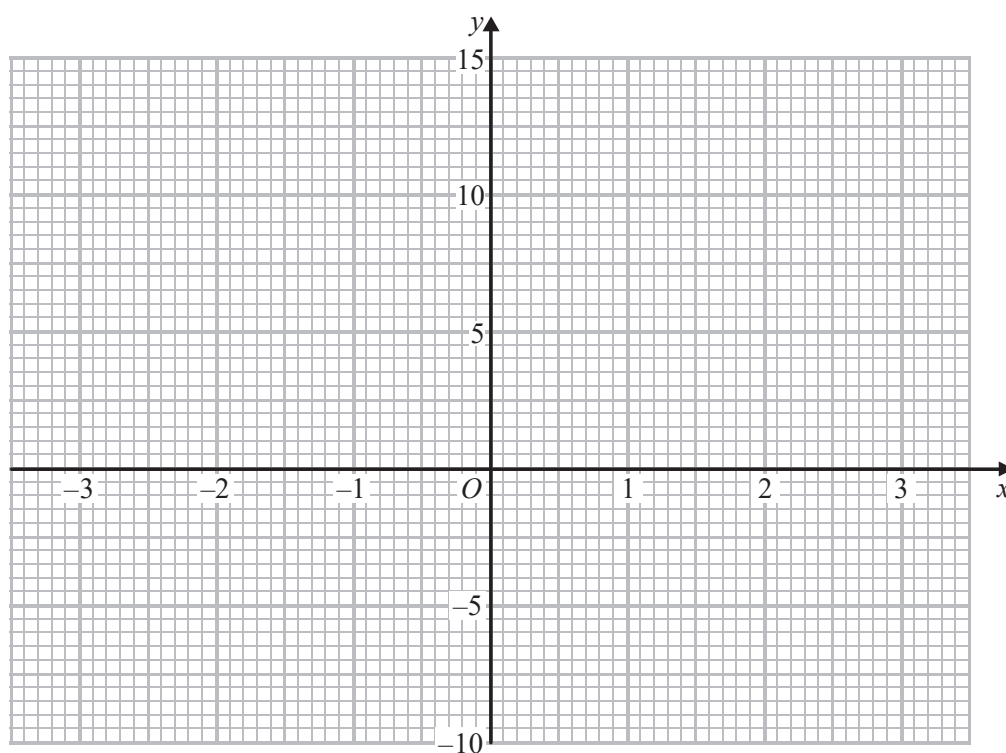
(Total for Question 24 is 4 marks)

22 (a) Complete this table of values for $y = x^2 + x - 4$

x	-3	-2	-1	0	1	2	3
y		-2	-4		-2		

(2)

(b) On the grid, draw the graph of $y = x^2 + x - 4$ for values of x from -3 to 3



(2)

(c) Use the graph to estimate a solution to $x^2 + x - 4 = 0$

(1)

(Total for Question 22 is 5 marks)

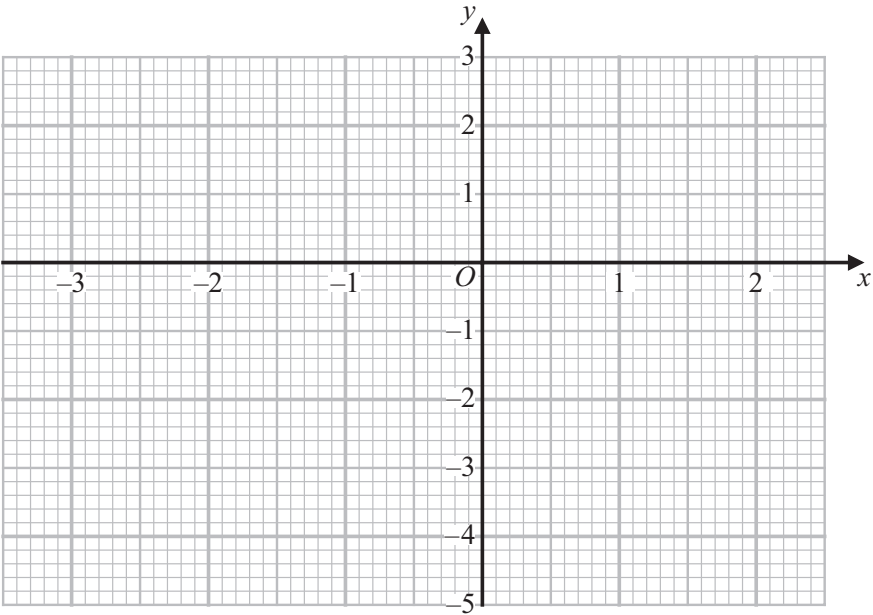


21 (a) Complete the table of values for $y = x^2 + x - 4$

x	-3	-2	-1	0	1	2
y	2		-4			

(2)

(b) On the grid, draw the graph of $y = x^2 + x - 4$ for values of x from -3 to 2



(2)

(c) Write down the coordinates of the turning point of the graph of $y = x^2 + x - 4$

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

(Total for Question 21 is 5 marks)

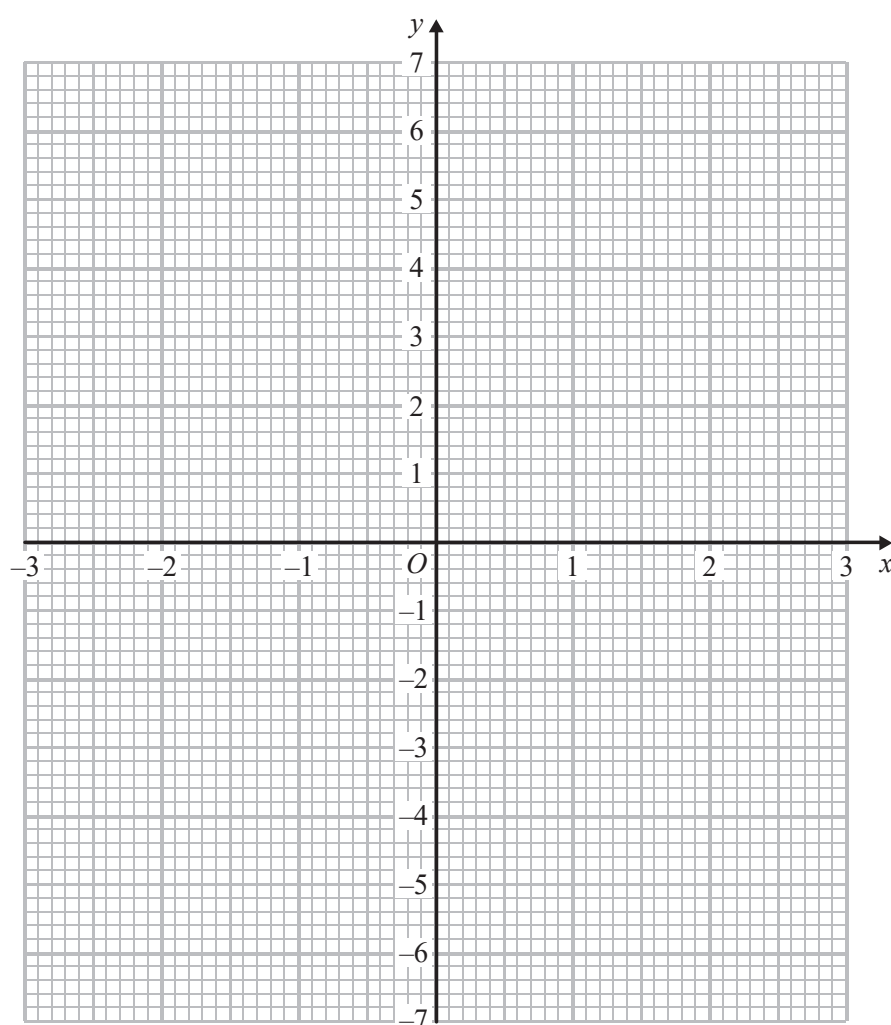
24 (a) Complete the table of values for $y = x^2 - x - 6$

x	-3	-2	-1	0	1	2	3
y	6			-6			

(2)

(b) On the grid, draw the graph of $y = x^2 - x - 6$ for values of x from -3 to 3

(2)



(c) Use your graph to find estimates of the solutions to the equation $x^2 - x - 6 = -2$

.....
(2)

(Total for Question 24 is 6 marks)

25 A force of 70 newtons acts on an area of 20 cm^2

The force is increased by 10 newtons.

The area is increased by 10 cm^2

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Helen says,

“The pressure decreases by less than 20%”

Is Helen correct?

You must show how you get your answer.

(Total for Question 25 is 3 marks)



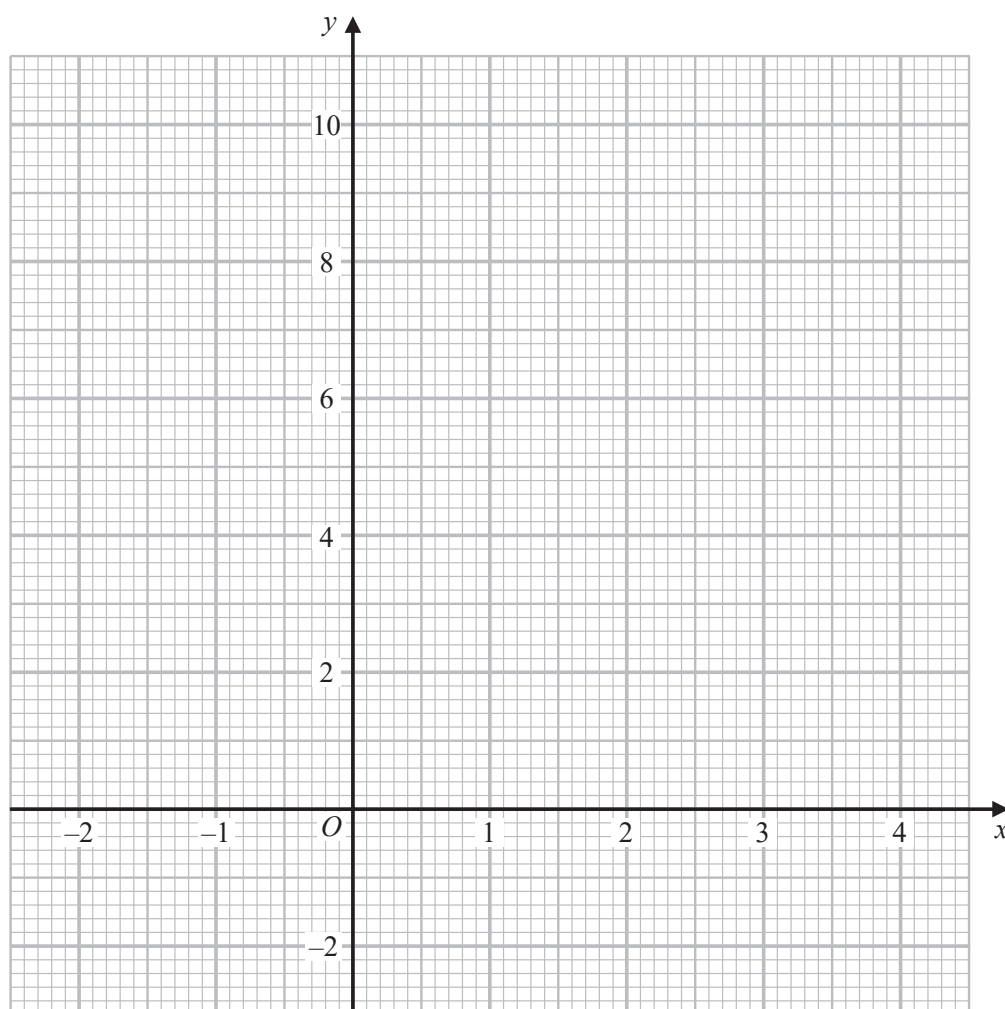
24 (a) Complete the table of values for $y = x^2 - 2x + 2$

x	-2	-1	0	1	2	3	4
y	10		2			5	

(2)

(b) On the grid, draw the graph of $y = x^2 - 2x + 2$ for values of x from -2 to 4

(2)



(c) Use your graph to find estimates of the solutions of the equation $x^2 - 2x + 2 = 4$

(2)

(Total for Question 24 is 6 marks)

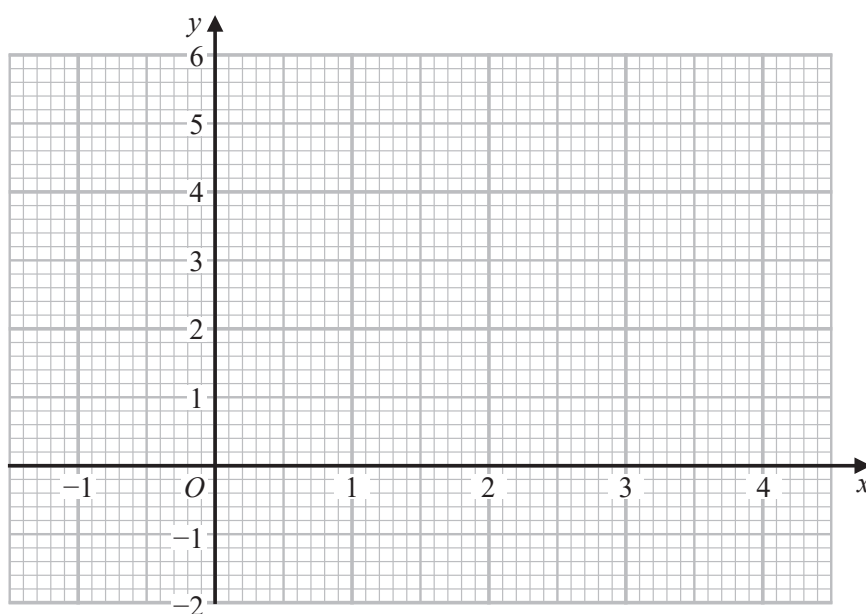


28 (a) Complete the table of values for $y = x^2 - 3x + 1$

x	-1	0	1	2	3	4
y		1	-1			

(2)

(b) On the grid, draw the graph of $y = x^2 - 3x + 1$ for values of x from -1 to 4



(2)

(c) Using your graph, find estimates for the solutions of the equation $x^2 - 3x + 1 = 0$

(2)

(Total for Question 28 is 6 marks)

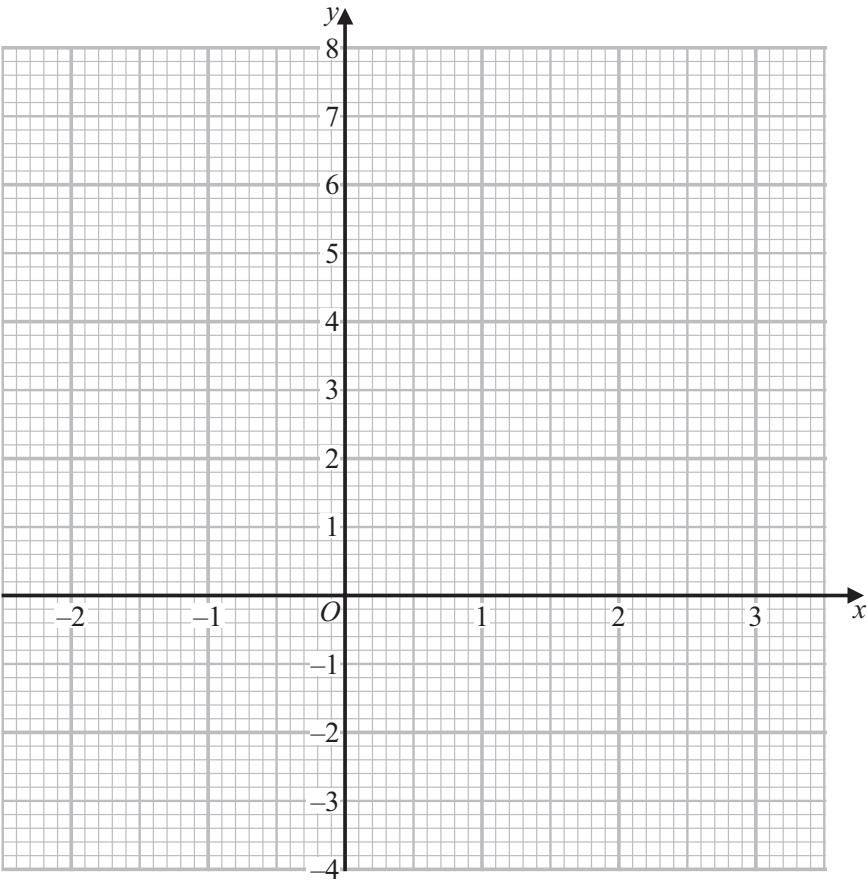


24 (a) Complete the table of values for $y = x^2 - x$

x	-2	-1	0	1	2	3
y	6		0		2	

(2)

(b) On the grid, draw the graph of $y = x^2 - x$ for values of x from -2 to 3



(2)

(c) Use your graph to find estimates for the solutions of the equation $x^2 - x = 4$

(2)

(Total for Question 24 is 6 marks)



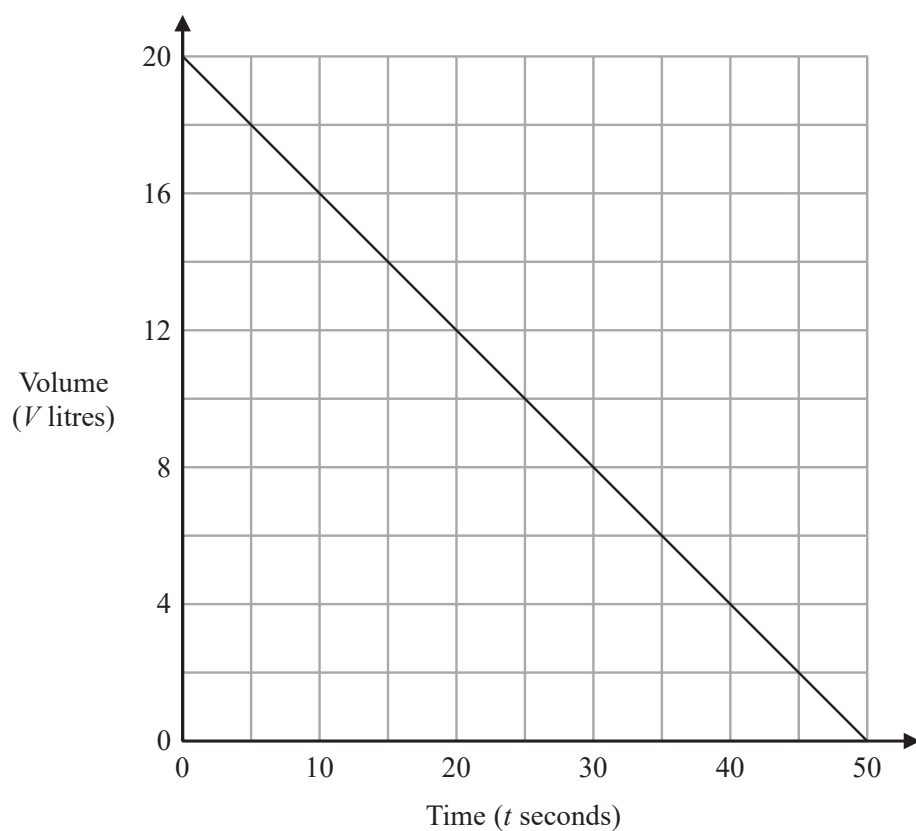
SUB-TOPIC A4c

REAL-LIFE GRAPHS & RATES OF CHANGE

Sub-topic A4c · 16 questions · 54 marks · lowest tariff first



24 The graph shows the volume of water, V litres, in a tank at time t seconds.



What does the gradient of this graph represent?

.....

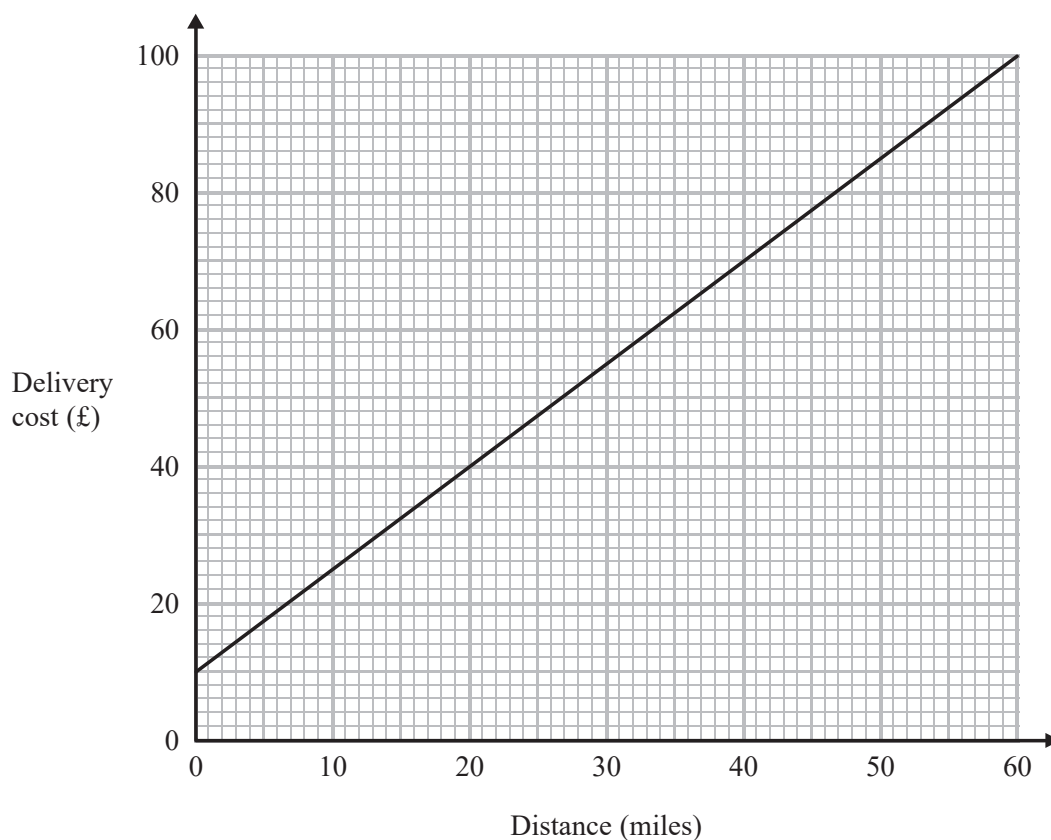
.....

.....

(Total for Question 24 is 1 mark)

12 Tom uses his lorry to deliver bricks.

You can use this graph to find the delivery cost for different distances.



For each delivery, there is a fixed charge plus a charge for the distance.

(a) How much is the fixed charge?

£
(1)

Tom makes two deliveries of bricks.

The distance of one delivery is 20 miles more than the distance of the other delivery.

(b) Work out the difference between the two delivery costs.

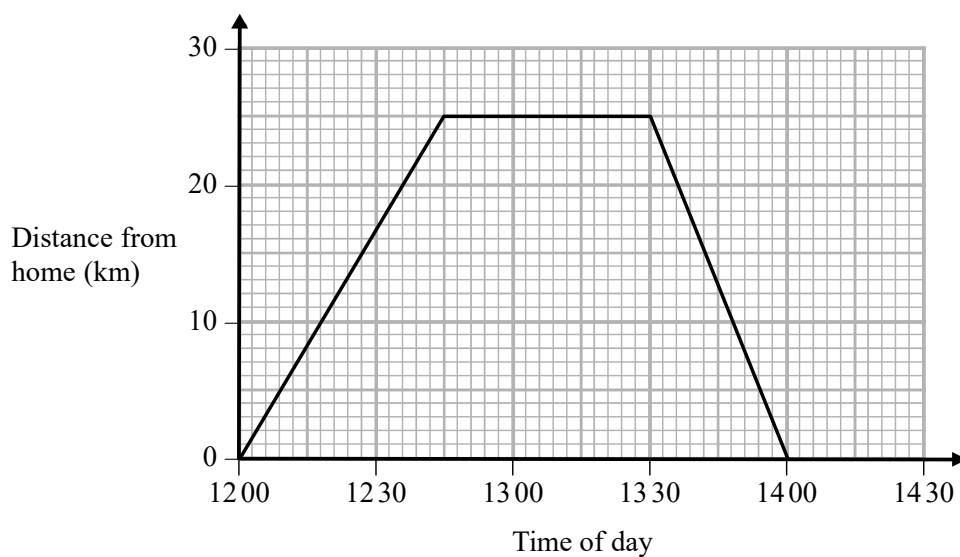
£
(2)

(Total for Question 12 is 3 marks)



- 16 Steve drove from his home to his friend's house.
He stayed at his friend's house and then drove home.

Here is Steve's travel graph.



- (a) For how many minutes did Steve stay at his friend's house?

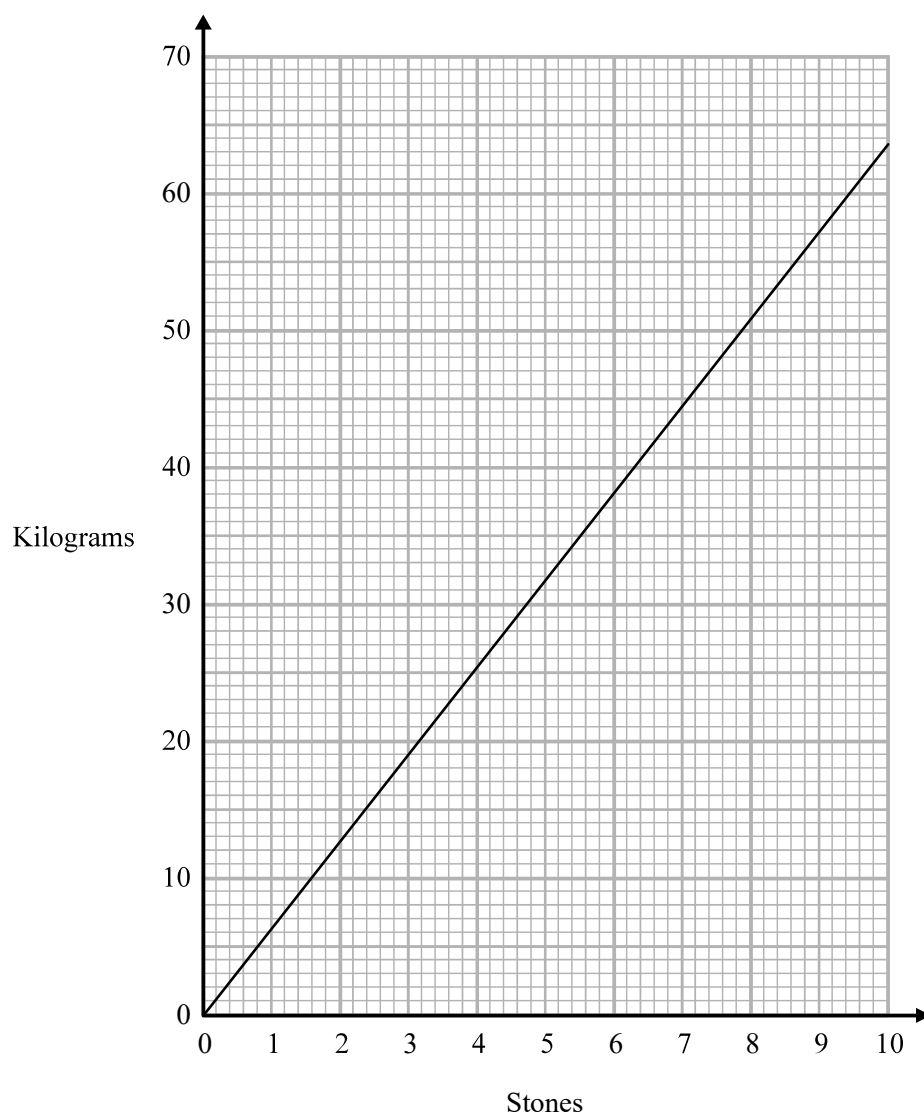
..... minutes
(1)

- (b) What was Steve's average speed on his journey home?

..... km/h
(2)

(Total for Question 16 is 3 marks)

11 You can use this graph to change between stones and kilograms.



(a) Change 3 stones to kilograms.

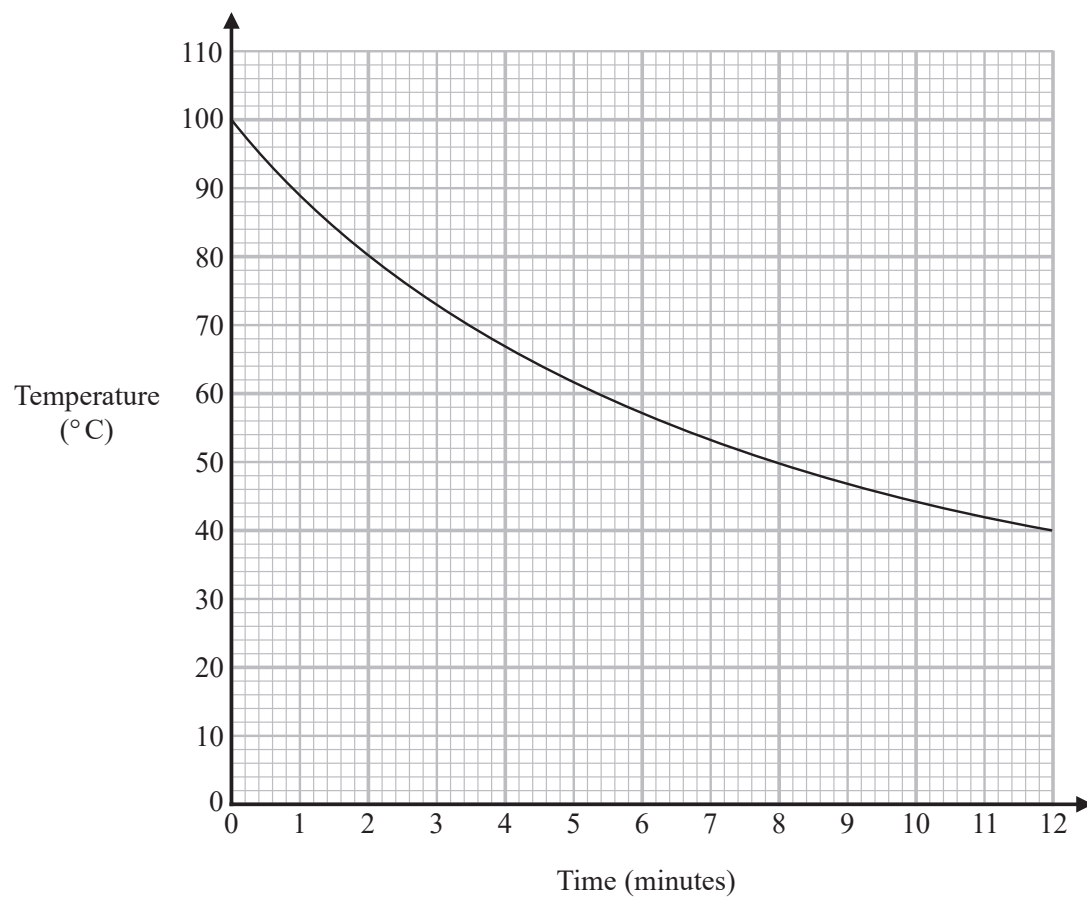
..... kilograms
(1)

(b) Change 80 kilograms to stones.

..... stones
(2)

(Total for Question 11 is 3 marks)

- 10 The graph shows information about the time, in minutes, a liquid has been cooling and the temperature of the liquid in $^{\circ}\text{C}$.



- (a) What is the temperature of the liquid at time 2 minutes?

..... $^{\circ}\text{C}$
(1)

Pam recorded the time when the liquid had a temperature of 50°C .

- (b) Write down this time.

..... minutes
(1)

Pam says that the temperature of the liquid drops more in the first 3 minutes of cooling than it does between time 9 minutes and time 12 minutes.

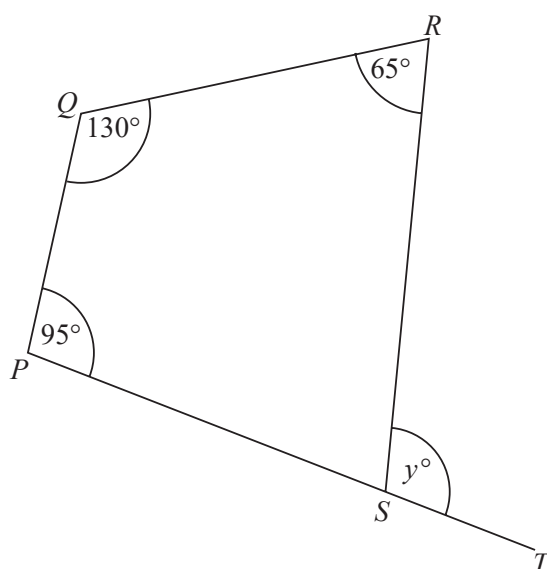
(c) Is Pam correct?

Give a reason for your answer.

(1)

(Total for Question 10 is 3 marks)

- 11 $PQRS$ is a quadrilateral.
 PST is a straight line.

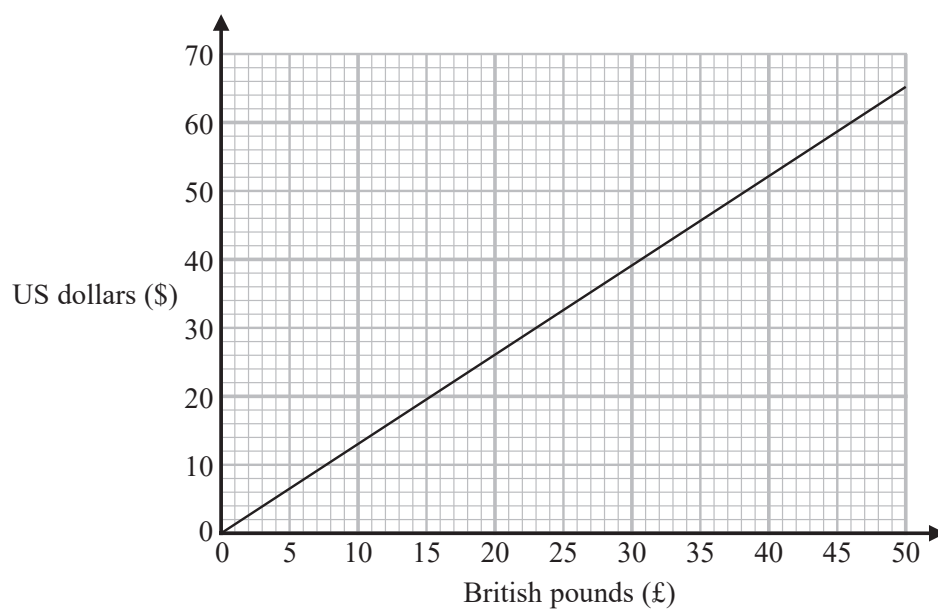


Find the value of y .

$y = \dots\dots\dots$

(Total for Question 11 is 3 marks)

18 This graph can be used to change between US dollars (\$) and British pounds (£).



Rosie bought a ring in the USA.
She paid 345 US dollars.

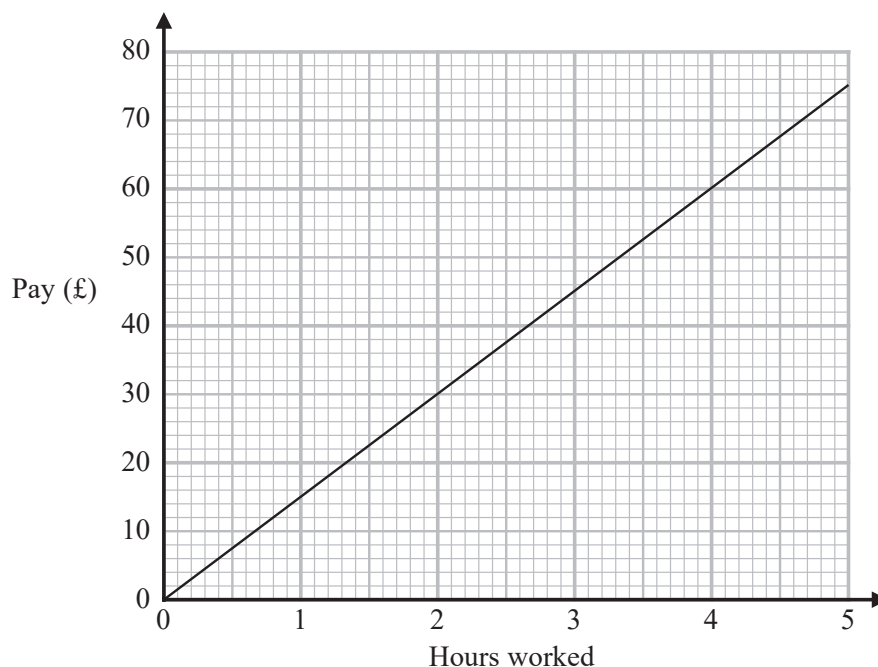
Work out in pounds the amount Rosie paid for the ring.

£

(Total for Question 18 is 3 marks)



- 14 Nazima uses this graph to find out how much money she is paid for the number of hours she has worked.



- (a) How much money is Nazima paid for each hour she works?

£
(1)

Last week Nazima worked for 36 hours.

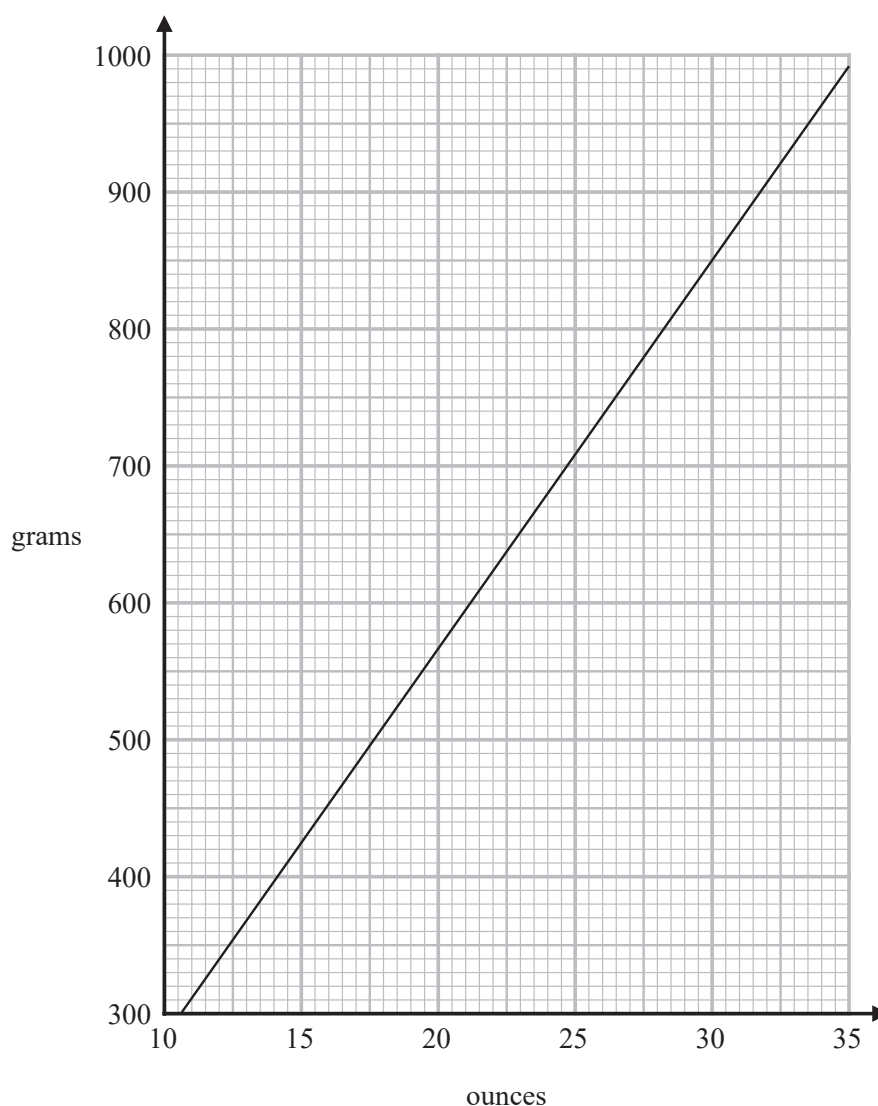
- (b) How much money was Nazima paid?

£
(2)

(Total for Question 14 is 3 marks)



14 You can use this graph to change between ounces and grams.



(a) Change 850 grams to ounces.

..... ounces
(1)

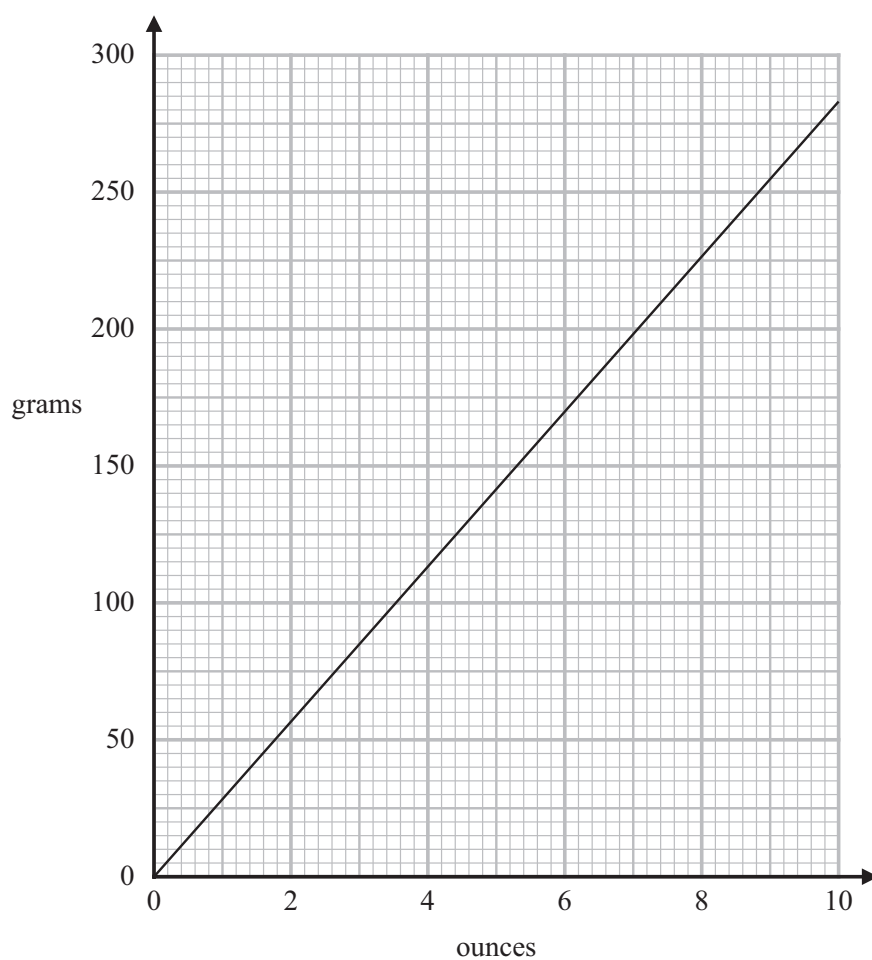
(b) Change 80 ounces to grams.

..... grams
(2)

(Total for Question 14 is 3 marks)



16 You can use this graph to change between ounces and grams.



(a) Change 6 ounces to grams.

..... grams
(1)

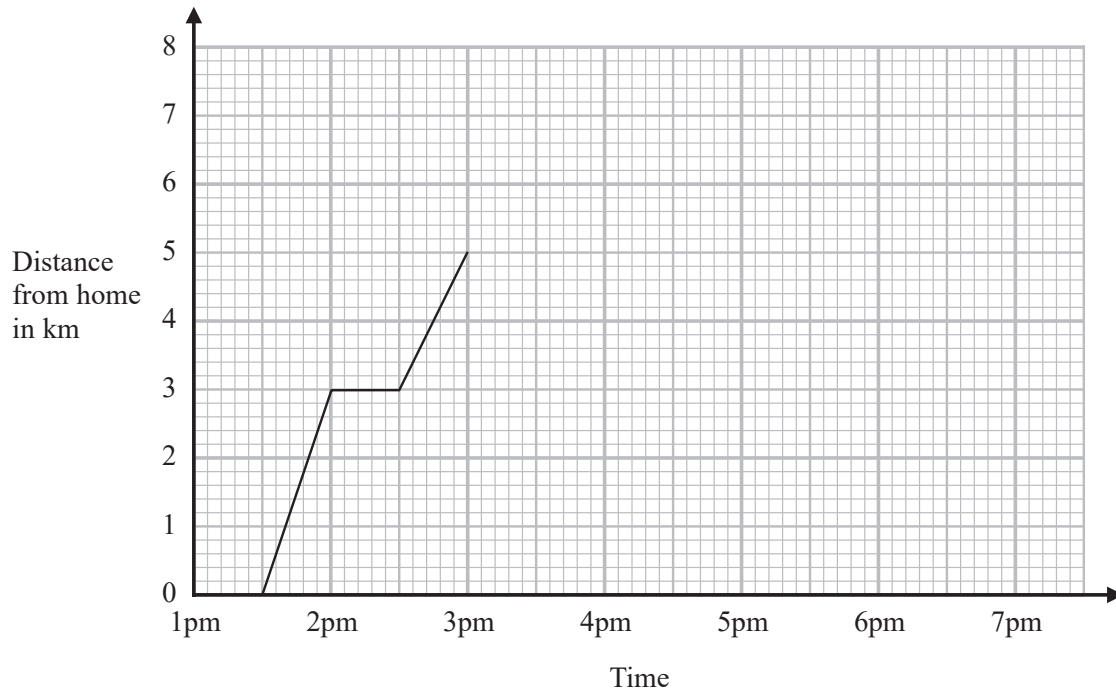
(b) Change 1 kg to ounces.

..... ounces
(2)

(Total for Question 16 is 3 marks)

14 Amy walked from her home to the skate park.

The travel graph of Amy's walk to the skate park is shown below.



On the way to the skate park Amy stopped at her friend's house.

(a) How far is it from her friend's house to the skate park?

..... km
(1)

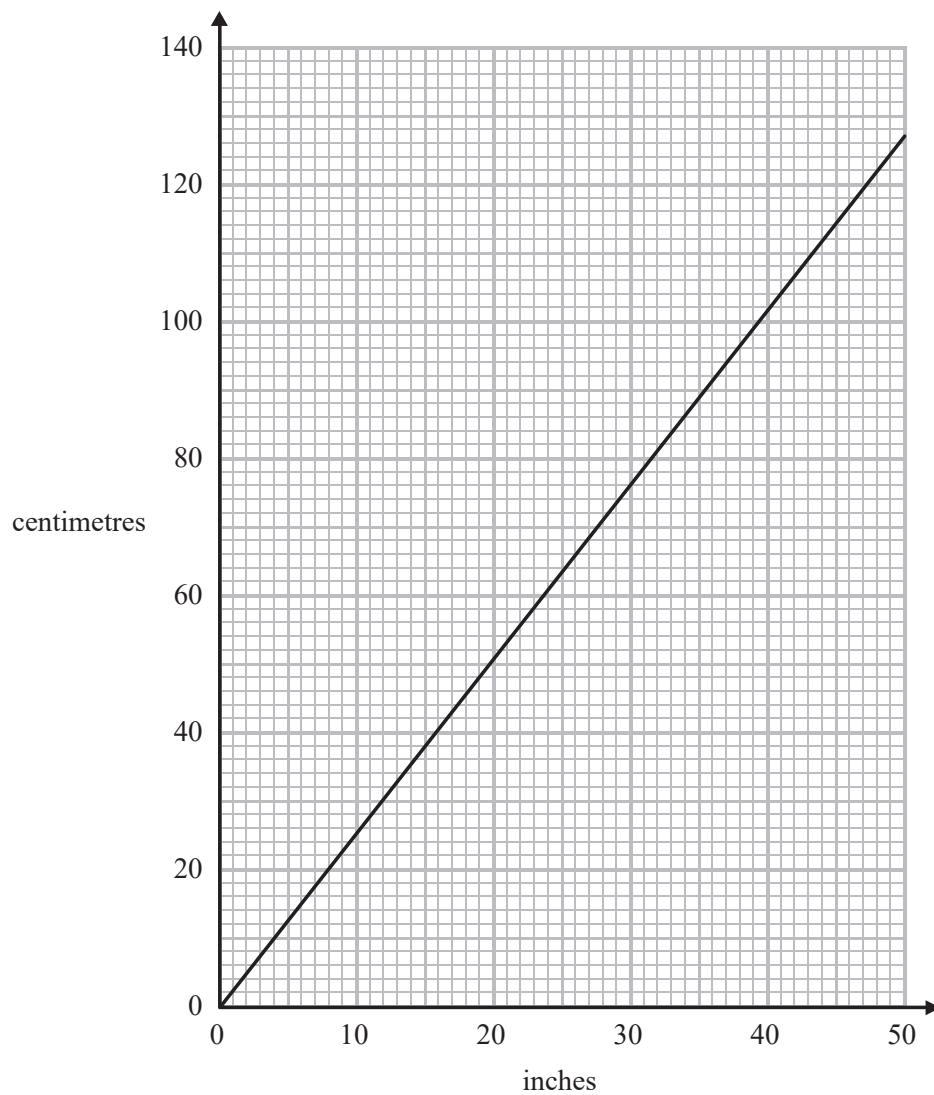
Amy stayed at the skate park for 2 hours.
Then she walked home at a steady speed.
She took 1 hour 30 minutes to walk home.

(b) Complete the travel graph.

(2)

(Total for Question 14 is 3 marks)

11 You can use this graph to change between inches and centimetres.



(a) Change 74 cm to inches.

..... inches
(1)

Daniel's height is 6 feet 3 inches.

1 foot = 12 inches

(b) What is Daniel's height in centimetres?

..... centimetres
(3)

(Total for Question 11 is 4 marks)

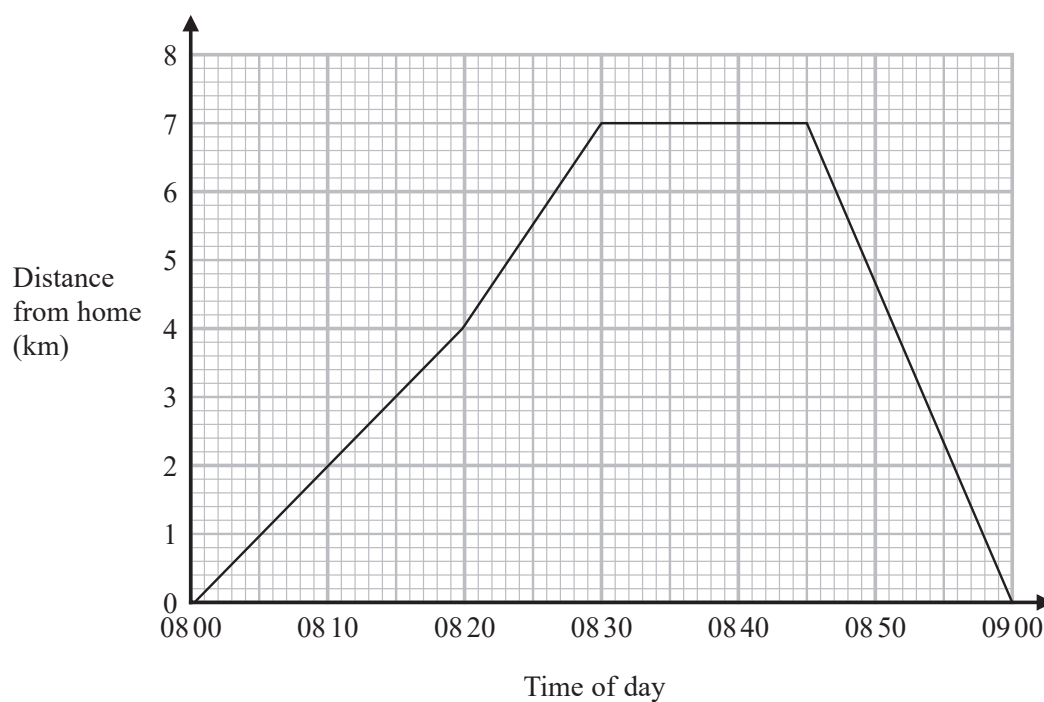
12 Find the value of $\frac{\sqrt{13.4 - 1.5}}{(6.8 + 0.06)^2}$

Write down all the figures on your calculator display.

.....
(Total for Question 12 is 2 marks)

- 19 Carly cycles to her friend's house.
She stays at her friend's house for a number of minutes.
Then she cycles home.

Here is the travel graph for her journey.



- (a) For how many minutes did Carly stay at her friend's house?

..... minutes
(1)

- (b) How far is Carly from her home at 08 50?

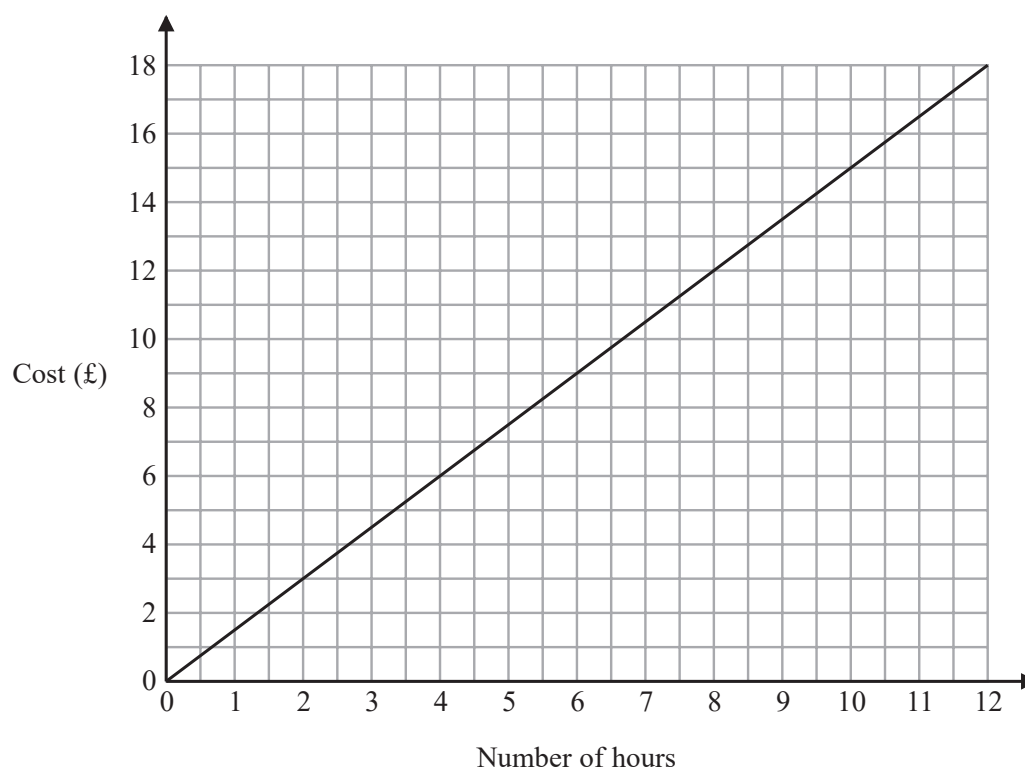
..... km
(1)

- (c) Work out Carly's speed, in km/h, for the first 20 minutes of her journey.

..... km/h
(2)

(Total for Question 19 is 4 marks)

10 This graph can be used to find the cost of parking a car in a car park for up to 12 hours.



(a) Use the graph to find the cost of parking a car for 4 hours.

£.....
(1)

Justin drives into the car park at 08 00 in the morning.
When he drives out of the car park he has to pay £9

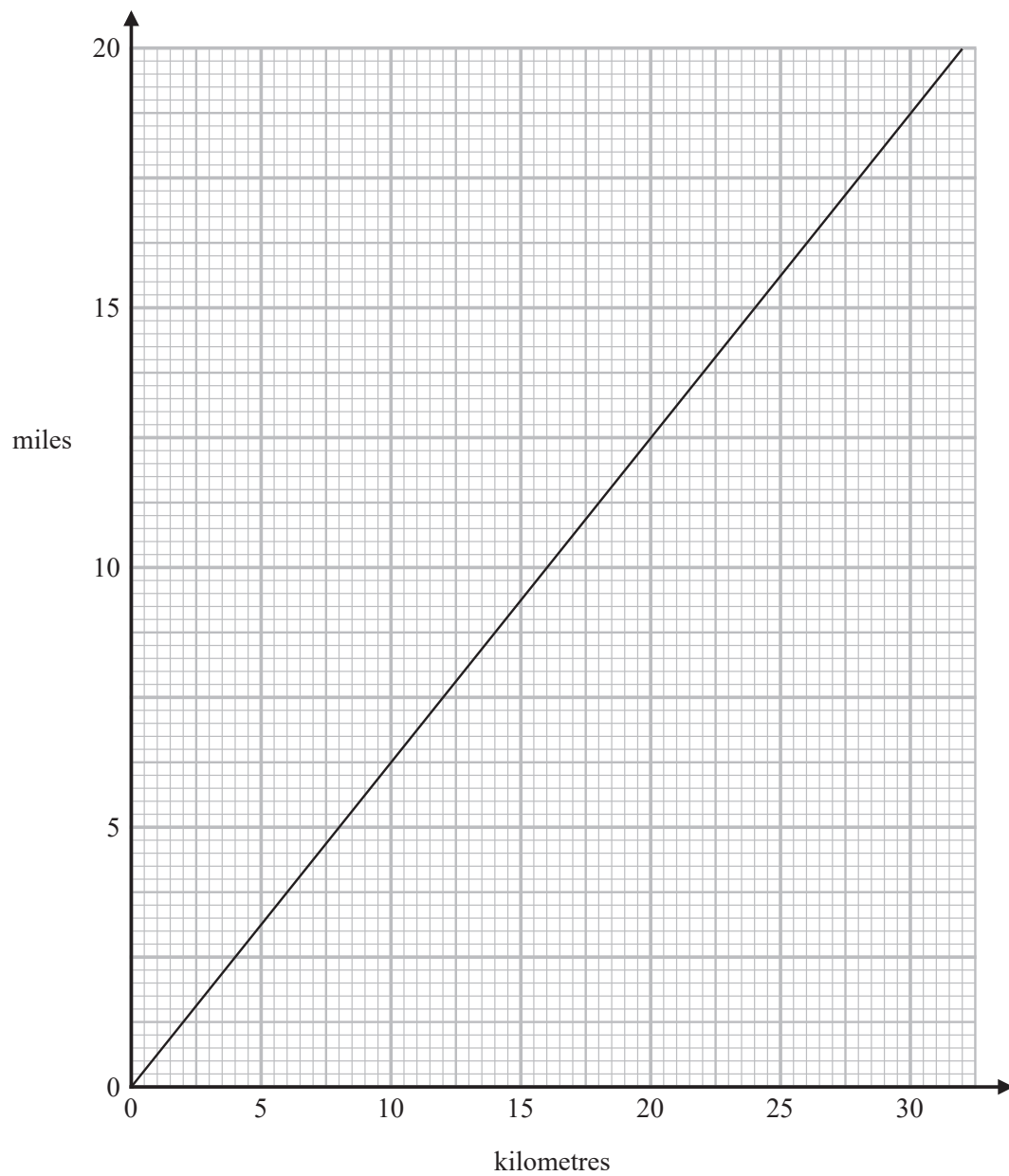
(b) At what time does Justin drive out of the car park?

.....
(3)

(Total for Question 10 is 4 marks)



11 You can use this graph to change between miles and kilometres.



(a) Change 10 miles into kilometres.

..... kilometres
(1)

Rob drives 17 miles from Bridlington to Scarborough.
He then drives 50 kilometres from Scarborough to Staithes.

- (b) What is the total distance Rob drives?
Give your answer in miles.

..... miles
(3)

(Total for Question 11 is 4 marks)

- 12 A shop sells apples and oranges.

There are 6 apples in each pack of apples.
There are 7 oranges in each bag of oranges.

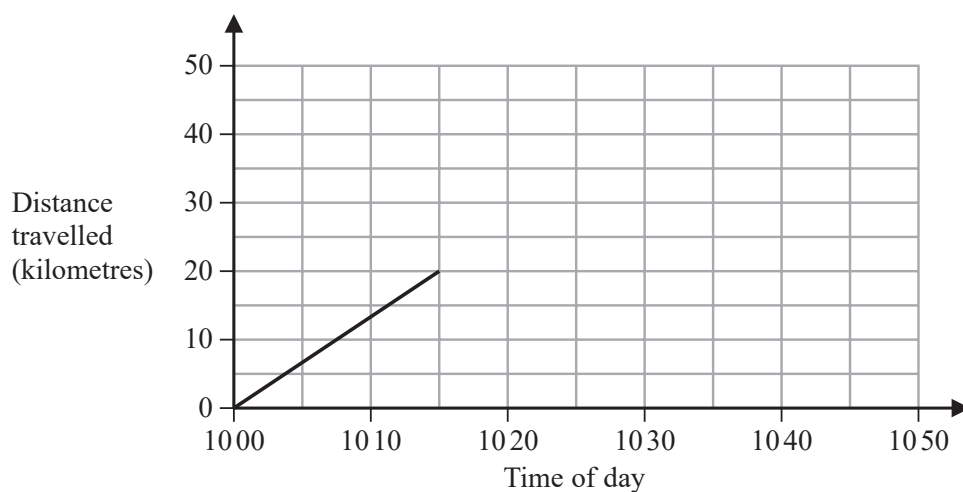
The shop sells x packs of apples and y bags of oranges.

Write an expression, in terms of x and y , for the total number of apples and oranges the shop sells.

.....
(Total for Question 12 is 2 marks)

23 Sam drives his car on a journey.

Here is the travel graph for the first 15 minutes of his journey.



(a) Work out Sam's speed, in km/h, for the first 15 minutes of his journey.

..... km/h
(2)

At 1015 Sam stops for 10 minutes and then drives for 20 minutes at a speed of 75 km/h.

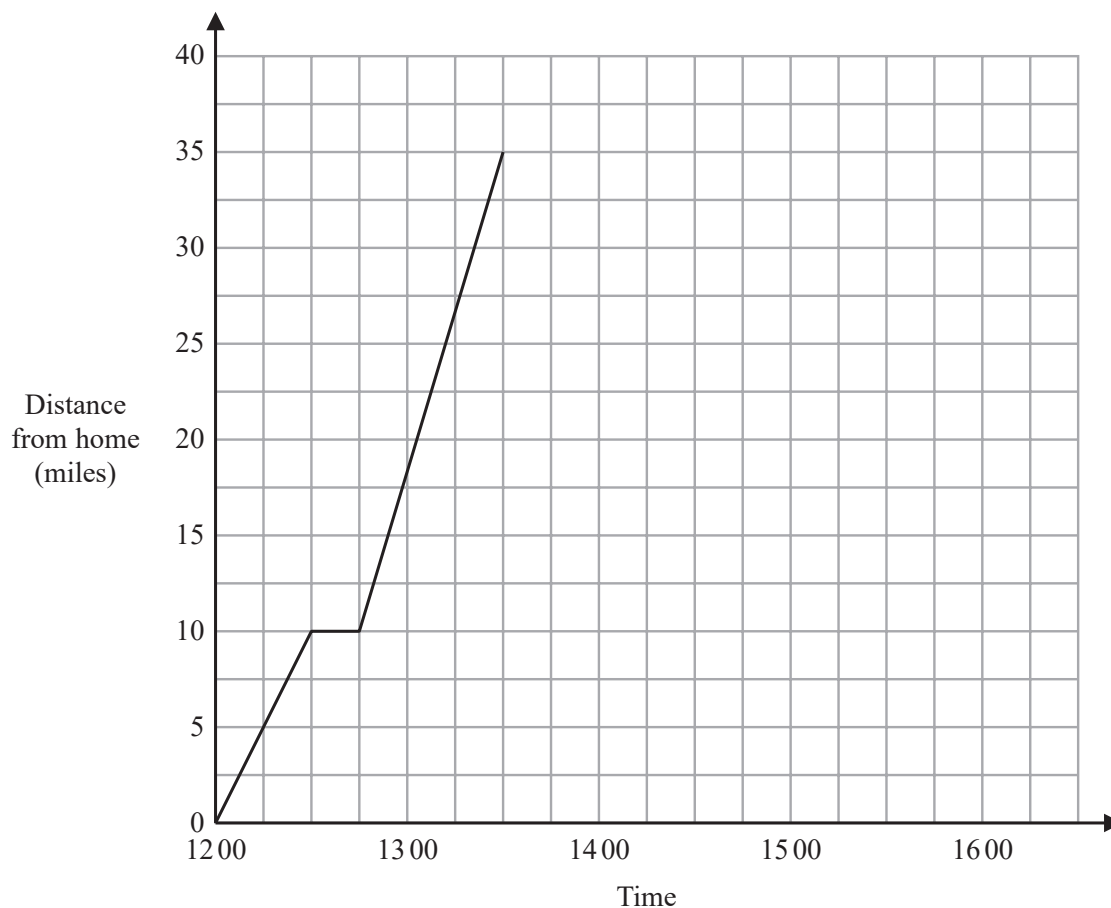
(b) On the grid, complete the travel graph for Sam's journey.

(3)

(Total for Question 23 is 5 marks)

13 Rowena drove from her home to a beach.

Here is a travel graph for her journey.



Rowena stopped at a cafe on her way to the beach.

(a) (i) How many minutes did Rowena take to drive to the cafe?

..... minutes
(1)

(ii) Write down the distance from Rowena's home to the cafe.

..... miles
(1)

Rowena stayed at the beach for $1\frac{1}{2}$ hours.

She then drove home without stopping.

Rowena arrived home at 16 00

(b) On the grid, complete the travel graph.

(2)

(c) Work out the average speed for the journey from the beach to Rowena's home.

..... miles per hour
(1)

(Total for Question 13 is 5 marks)

- 14** 120 boxes cost £6
270 bags cost £10

A bag is cheaper than a box.

How much cheaper?

Give your answer in pence correct to 1 decimal place.

.....p

(Total for Question 14 is 4 marks)



MARK SCHEMES

official mark schemes, in the same order as the questions



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
27	35.3	P1	for starting the process to find length of third side of triangle, eg $9^2 - 6^2 (=45)$ or $6^2 + x^2 = 9^2$	[radius] is any value If an answer in the range 35.2 to 35.4 is given in the working space then incorrectly rounded, award full marks No working, answer only no marks
		P1	for $\sqrt{9^2 - 6^2}$ or $\sqrt{81 - 36}$ or $\sqrt{45}$ or $3\sqrt{5}$ ($= 6.7..$) or $r^2 = 45$	
		P1	for stating or using $\pi \times [\text{radius}]^2 \div 4$	
		A1	for answer in range 35.2 to 35.4	
28	24	M1	for a complete method eg $360 \div 15 (=24)$	If extra steps are shown do not award this mark.
		A1	cao	
29	2	B1	cao	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	0.45	B1	cao	
2	2 factors	B1	at least 2 of 1,5,7,35	No incorrect factors
3	10 45	B1	for 10 45	Accept any time notation
4	11	B1	cao	
5	Midpoint marked	B1	within tolerance	
6	(a) $4ab$	B1		May be seen in working. Accept if no ambiguity.
	(b) $3x + 8$	M1	for method to collect terms eg $3x$ or 8	
		A1	for $3x + 8$	
7	EJ, EK, FJ, FK, GJ, GK	B2 (B1)	fully correct list with no repeat for at least 4 correct	Allow letters in either order
8	2540 shown	M1 M1 A1	for finding the cost of one item eg $2 \times 600 (=1200)$ or $7 \times 120 (=840)$ or $2 \times 250 (=500)$ full process eg “1200” + “840” + “500” ($=2540$) or $2500 - “1200” - “840” - “500” (= \pm 40)$ for 2540 or ± 40	Ignore written statements as long as the correct figures are shown



Paper: 1MA1/1F				
Question	Working	Answer	Mark	Notes
25		70.5	P1 P1 P1 P1 A1	starts process of Pythagoras e.g. $5^2 + 12^2$ complete process for Pythagoras e.g. $\sqrt{5^2 + 12^2}$ or $\sqrt{25 + 144}$ or $\sqrt{169}$ (=13) (dep P1 for Pythagoras) process of adding all the lengths e.g. $5 + 5 + 12 + 12 + "13"$ (=47) (indep) process of multiplying at least 2 lengths by 1.5 cao SC: any evidence of working with Pythagoras award the P1 or P2
26		comparison	M1 A1	starts to manipulate expression e.g. $3y = 9x - 6$ or $3y = 9x - 5$ gives equation(s) which can be used to show that the gradients of the two lines are the same e.g. $y = 3x - 5/3$
27	(a)	2b	B1	oe
	(b)	b – a	B1	oe
	(c)	– a – b	B1	ft oe



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
13	D, F, A	C2 (C1)	for all 3 correct for 1 or 2 correct)	
14 (a)	6 4799 7 0015667 8 0011247 9 14	B2 (B1) B1	for correct ordered stem and leaf for fully correct unordered or ordered with one error or omission) (indep) for key (units not required but must be correct if stated) eg $6 \mid 4 = 64$ (marks)	
(b)	Explanation	C1 C1	for identifying "6" students failed (ft their diagram) OR for $20 \div 4 (= 5)$ for comparing $\frac{1}{4}$ with $\frac{6}{20}$ or $\frac{3}{10}$ (ft their diagram) OR for comparing "6" with 5	Explanation does not need to state that Omar is wrong, but just needs to provide two comparable values (that are not the same) unless ft values show that Omar is not wrong in which case a statement is needed.
15 (a)	Incorrect order of operation	C1	for identifying an incorrect order of operation, eg should be $12 - 8$ or "should multiply first"	Showing that $12 - 2 \times 4$ is 4 (and not 40) is insufficient for this mark; the explanation should focus on what Jenny has done wrong.
(b)	Statement	C1	for stating that the range is the difference between the greatest and least values, or stating that he didn't put numbers in order	Stating the correct calculation for the range $(8 - 1)$ or stating the (correct) range as 7 is sufficient for this mark.



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	400	P1 P1 A1	for finding the total weight of 4 blocks, eg $650 \times 4 (= 2600)$ or $0.65 \times 4 (= 2.6)$ or for using $1 \text{ kg} = 1000\text{g}$ eg $650 \div 1000 (= 0.65)$ or $3 \times 1000 (= 3000)$ for subtraction, eg. $3 \times 1000 - "2600"$ or $3 - "2.6" (= 0.4)$ cao SC B1 for 2350	Writing 1 kg as 1000g is insufficient without it being used in a calculation
9	45	M1 A1	for $180 - (100 + 35)$ oe cao	Answer may be written on the diagram.
10	(a) A plotted at (3, 2) (b) (-1, 0)	B1 B1	cao cao	Accept a cross or dot or A written at (3, 2) with or without labelling provided not ambiguous Could be shown on the diagram
11	HHH HHT HTH HTT THH THT TTH TTT	M1 A1	for at least 4 correct different combinations for fully correct list with no extras or repeats	Accept words or unambiguous abbreviations For M1 ignore extras or repeats;

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	12	P1 P1 A1	for a process to find the area of cross section, eg $750 \div 25 (= 30)$ oe $\frac{1}{2} \times 5 \times h$ oe for a correct equation in h , eg $750 \div 25 = \frac{1}{2} \times 5 \times h$ oe $\frac{1}{2} \times 5 \times h \times 25 = 750$ oe or for a complete process to find h , eg. $\frac{750}{25} \times \frac{2}{5}$ oe or “30” $\times 2 \div 5$ cao SC B1 for answer of 6 if P0 scored	May use any letter for h or may use ?
26	Shown	M1 M1 M1 A1	for a correct expression for the area of one face of the cube, eg. x^2 or a correct expression for the surface area of the cube, eg $6 \times x^2$ for a correct expression for the surface area of the sphere, eg $4 \times \pi \times 3^2 (= 36\pi)$ for forming a suitable equation, eg $6 \times x^2 = 4 \times \pi \times 3^2$ or $6x^2 = “36\pi”$ for completing the method to $x = \sqrt{6\pi}$ or $k = 6$	No marks for $x = \sqrt{6\pi}$ without any working. $6 \times x^2 = 4 \times \pi \times 3^2$ $x^2 = 36\pi \div 6$ $x = \sqrt{6\pi}$
27	7.15 and 7.25	B1 B1	for 7.15 as the lower bound for 7.25 as the upper bound	Accept 7.249 oe or 7.2499... oe
28 (i)	−4	B1	cao	
(ii)	(0, 3)	B1	cao	



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
15	-0.5, 1	M1 A1	for one correct coordinate or midpoint shown on diagram or correct method, eg $\frac{-3+2}{2}$ or $\frac{-2+4}{2}$ or for the coordinates reversed, eg 1, -0.5 for -0.5, 1 oe	
16	19	P1 P1 P1 A1	for process of finding perimeter in terms of x , eg $2x - 5 + x + 1 + x - 1 + 2x$ oe for process to form equation, eg " $6x - 5$ " = 52 (dep on P2) for a correct process to find x , eg $(52 + 5) \div 6$ (= 9.5) or for a correct process to find $2x$, eg $(52 + 5) \div 3$ or fit an equation of the form $ax + b = c$, cao	This mark may be awarded for a correct but unsimplified equation, eg, $2x - 5 + x + 1 + x - 1 + 2x = 52$ oe Trial & Improvement attempts must be fully correct giving $x = 9.5$ before any credit given a , b and c must be clearly stated but need not be correct

Paper: 1MA1/1F																				
Question	Answer	Mark	Mark scheme	Additional guidance																
25	Line drawn	B3 (B2) (B1)	for a correct line between $x = -3$ and $x = 3$ for a correct straight-line segment through at least 3 of $(-3, 13)$, $(-2, 9)$, $(-1, 5)$, $(0, 1)$, $(1, -3)$, $(2, -7)$, $(3, -11)$ or for all of these points plotted but not joined or for a line drawn with a negative gradient through $(0, 1)$ and clear intention to use a gradient of -4 , eg line through $(0,1)$ and $(0.5, -1)$ for at least 2 correct points stated or plotted or for a line drawn with a negative gradient through $(0, 1)$ or a line with gradient -4	Ignore any incorrect points Table of values <table><tr><td>x</td><td>-3</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>13</td><td>9</td><td>5</td><td>1</td><td>-3</td><td>-7</td><td>-11</td></tr></table> Ignore any incorrect points coordinates may be in a table or in working	x	-3	-2	-1	0	1	2	3	y	13	9	5	1	-3	-7	-11
x	-3	-2	-1	0	1	2	3													
y	13	9	5	1	-3	-7	-11													
26	$\begin{pmatrix} 9 \\ 11 \end{pmatrix}$	M1 A1	for $\begin{pmatrix} 2 \times 5 \\ 2 \times 2 \end{pmatrix} [= \begin{pmatrix} 10 \\ 4 \end{pmatrix}]$ or $2 \times 5 - 1 (= 9)$ or $2 \times 2 + 7 (= 11)$ cao																	



Paper: 1MA1/2F					
Question		Answer	Mark	Mark scheme	Additional guidance
20	(a)	m^7	B1	cao	
	(b)	$125n^3p^9$	B2	cao	Allow multiplication signs
			(B1)	for 2 of 3 terms correct in a single product)	$125n^3p^x$ or $125n^x p^9$ where $x \neq 0$ or an^3p^9 where a is a number
	(c)	$8q^6r^3$	B2	cao	Allow multiplication signs
			(B1)	for 2 of 3 terms correct in a single product)	$8q^6r^x$ or $8q^x r^3$ where $x \neq 0$ or aq^6r^3 where a is a number
21	(a)	280	M1	for listing at least 3 multiples of both 40 and 56 OR finds the prime factors of both 40 and 56	40, 80, 120, ... 56, 112, 168, ... OR 2,2,2,5 and 2,2,2,7
			A1	cao	
	(b)	60	B1	60 or $2^2 \times 3 \times 5$ oe	2^2 , 3, 5 not enough ie must be a product
22		$y = 3x - 6$	M1	for a correct method to find the gradient of the line, or $m = 3$ OR identifies -6 as the intercept in words or in a partial equation OR $y - b = m(x - a)$ where $m \neq 3$ and (a, b) is a correct coordinate	Just ringing -6 is insufficient
			M1	for $y = 3x + c$ or (L=) $3x - 6$ or $y = "3"x - 6$ OR $y - y_1 = 3(x - x_1)$ or $y - b = "3"(x - a)$ where (a, b) is a correct coordinate	Award of this mark implies the first M1 c must be seen either as a letter or a number
			A1	accept $y = 3x + -6$ oe	

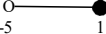


Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	(a) -2, -1	B1	cao	
	(b) Point at (2, 3)	B1	cao	Allow without label provided unambiguous; allow if the cross is nearer to (2, 3) than other points.
	(c) Line drawn	B1	cao	Label not required; allow hand-drawn line. Allow any length provided intention is clear.
9	30	M1	$2 \times 9 + 3 \times 4$	May be shown in stages but an intention to add 2×9 and 3×4 must be clear
		A1	cao	
10	3 and 29 or 13 and 19	M1	for two numbers with a sum of 32, only one of which is prime, eg 5, 27 or 1, 31	Do not accept 1 as a prime number.
		A1	cao	
11	(a) $\frac{10}{16}$	B1	cao	Accept any equivalent fraction
	(b) $\frac{11}{12}$	M1	for $\frac{10}{12}$ OR for using a suitable common denominator other than 12 with at least one of the two fractions correct, eg $\frac{2}{24} + \frac{20}{24}$	
		A1	for $\frac{11}{12}$ or	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
24	No (supported)	P1	calculates area of trapezium eg $\frac{1}{2} \times 7 \times (10+16)$ (= 91)	[area of trapezium] needs to be clearly stated if the process of finding the area is not clear
		P1	for division by coverage eg $\div 2$ or [area of trapezium] $\div 2$ (= 45.5) or process to find coverage per tin eg 5×2 (= 10)	
		P1	for division to find the number of tins eg $\div 5$ or "45.5" $\div 5$ (= 9.1) or [area of trapezium] $\div$ "10" (= 9.1)	
		P1	(dep on at least P2) for a process to multiply a whole number of tins (rounded up) by 16.99	
		C1	for 'No' supported by correct figures eg 169.9 or 90 and 91	
25	7	P1	process to use gradient eg $y=3x+c$ or $c = -6$ or $\frac{15-9}{d-5}$ or $(15-9) \div 3$ or (6, 12)	Condone use of a letter other than d , for d Must show processes to get as far as $d =$ Award P2 for an answer of (7, 15)
		P1	(dep) full process to rearrange equation formed to isolate d eg rearrangement of $15 = 3d - 6$ or $3 = \frac{15-9}{d-5}$ or for $5 + \frac{15-9}{3}$	
		A1	cao	



Paper: 1MA1/2F																				
Question	Answer	Mark	Mark scheme	Additional guidance																
20 (a)	$n > 2$	M1	for a method to isolate terms in n in any inequality or equation eg. $14n - 11n > 6$ or $n = 2$	Ignore incorrect inequality sign and accept “=” sign																
		A1	cao																	
		M1	for $-2 - 3 < x \leq 4 - 3$ ($-5 < x \leq 1$)																	
		M1	for drawing a line from -5 to 1 or (indep) for an open circle at either -2 or -5 or (indep) for a closed circle at 4 or 1																	
		A1	cao																	
20 (b)		M1	for $-2 - 3 < x \leq 4 - 3$ ($-5 < x \leq 1$)	A circle around -5 and 1 implies M1																
		M1	for drawing a line from -5 to 1 or (indep) for an open circle at either -2 or -5 or (indep) for a closed circle at 4 or 1	A line from -5 to 1 implies M2 if no working shown																
		A1	cao																	
21	Graph	B3	for a correct line between $x = -2$ and $x = 4$	Ignore any incorrect points. Points need not be plotted for a correct line (segment) drawn Table of values <table border="1"><tr><td>x</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>-7</td><td>-5</td><td>-3</td><td>-1</td><td>1</td><td>3</td><td>5</td></tr></table>	x	-2	-1	0	1	2	3	4	y	-7	-5	-3	-1	1	3	5
		x	-2		-1	0	1	2	3	4										
		y	-7		-5	-3	-1	1	3	5										
		(B2	for a correct straight line segment through at least 3 of $(-2, -7), (-1, -5), (0, -3), (1, -1), (2, 1), (3, 3), (4, 5)$ or for all of these points plotted but not joined OR for a line drawn with a positive gradient through $(0, -3)$ and clear intention to use a gradient of 2, eg line through $(0, -3)$ going across 2 squares and up 4 squares)																	
		(B1	for at least 2 correct points stated or plotted OR for a line drawn with a positive gradient through $(0, -3)$ OR a line with gradient 2)		Ignore any incorrect points Coordinates may be in a table or in working															

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
7	Correct pictogram drawn	C1	deduces that 1 ellipse represents 12 (eggs) oe	eg. $\frac{1}{2}$ ellipse represents 6 (eggs), $\frac{1}{4}$ ellipse represents 3 (eggs)
		C1	2 ellipses for Tuesday oe	some interpretation of shapes will be needed
		C1	$2\frac{1}{4}$ ellipses for Wednesday oe	
		C1	correctly represented key	
			Alternative (using 1 ellipse to represent a different number of eggs)	
		C2	for a correctly shown key, eg. 1 drawn ellipse represents 4 (eggs) oe and one day in agreement with their key.	eg. a correctly represented key plus, $4\frac{1}{2}$ ellipses for Monday oe
		C1	for a second day in agreement with their key	eg. 6 ellipses for Tuesday oe
		C1	for a third day in agreement with their key.	eg. $6\frac{3}{4}$ ellipses for Wednesday oe
8	(a) (2, 3)	B1	cao	
	(b) (0, -1)	B1	cao	
	(c) C at (-2,1)	B1	cao	If more than one point marked accept if labelled, otherwise not, unless clear

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
18	Line Drawn	B3 (B2 <		

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
9	(a) $(-1,2)$	B1	cao	
	(b) $(1,4)$ marked	B1	for the point $(1, 4)$ unambiguously marked on the grid	need not be labelled if clear
	(c) $y = -3$ shown	B1	for correct line unambiguously marked	need not be labelled if clear accept a line drawn freehand
10	(i) terms given	B1	states two terms eg 11, 10 or 9, 6	May be written on the sequence with no contradiction elsewhere
	(ii) explanation	C1	explanation Acceptable examples Take away 2 then 1; take away 4 then 3 The difference goes down by 1 each time $-4, -3; -2, -1$ The differences are 4 and 3; the differences are 2 and 1 Not acceptable examples It goes down by 1 each time An algebraic rule	
11	160	M1	for $8 \times 5 \times 4$	
		A1	cao	
12	$1 : 6 : 3$	M1	for any two algebraic statements from $x, 6x, 6x/2$ oe or any two numbers as a correct ratio eg $1 : 6$ or $6 : 3$ or $1 : 3$ oe or any 3-term ratio using the numbers 1, 6 and 3	For any equivalent ratio.
		A1	oe	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
28	$y = -2x + 3$	M1	for a correct method to find the gradient of the line, eg $\frac{-1-3}{2-0}$ ($= -2$) or uses 3 as the intercept in $y = mx + c$, eg $y = mx + 3$ oe, $y = 1.5x + 3$	[−2] must be identifiable as their gradient Any correct equation gets 3 marks
		M1	for $y = [-2]x + c$ or for (L=) $3 - 2x$ or uses their gradient and a point on the line, eg $y - -1 = [-2](x - 2)$	
		A1	for $y = -2x + 3$ oe	
29	15.6	P1	for beginning process to use Pythagoras to find diameter or radius, eg $3.5^2 + 3.5^2 (= 24.5)$ or $1.75^2 + 1.75^2 (= 6.125)$	Award P1 for a correct Pythagorean statement eg $3.5^2 + 3.5^2 = \text{diameter}^2$ 4.94.. or 2.47.. truncated or rounded can imply P2 Accept use of 3.14 or better for π Accept use of truncated values for 4.94.. or 2.47.. If an answer is shown in the range in working and then incorrectly rounded award full marks. Award 0 marks for a correct answer without correct supportive working.
		P1	for complete process to find diameter or radius, eg $\sqrt{3.5^2 + 3.5^2}$ or $\sqrt{24.5}$ ($= 4.94..$) or $\sqrt{1.75^2 + 1.75^2}$ or $\sqrt{6.125}$ ($= 2.47...$)	
		P1	for process to find circumference of circle, eg $\pi \times "4.94..."$ ($= 15.55...$) or $2 \times \pi \times "2.47..."$ ($= 15.55...$)	
		A1	for answer in range 15 to 16	



Paper: 1MA1/3F																			
Question	Answer	Mark	Mark scheme	Additional guidance															
19	$y = 3x - 2$ drawn	B3	for a correct line between $x = -2$ and $x = 3$	<table><tr><td>x</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>-8</td><td>-5</td><td>-2</td><td>1</td><td>4</td><td>7</td></tr></table>	x	-2	-1	0	1	2	3	y	-8	-5	-2	1	4	7	
x	-2	-1	0	1	2	3													
y	-8	-5	-2	1	4	7													
		(B2)	for a correct straight line segment through at least 3 of $(-2, -8), (-1, -5), (0, -2), (1, 1), (2, 4), (3, 7)$ or for all of these points plotted but not joined OR for a line drawn with positive gradient through $(0, -2)$ and clear intention to use a gradient of 3, eg line through $(0, -2)$ going across 2 squares and up 6 squares)	Ignore any incorrect points. Points need not be plotted for a correct line (segment) drawn															
		(B1)	at least 2 correct points stated or plotted OR for a line drawn with positive gradient through $(0, -2)$ OR a line with gradient of 3)	Ignore any incorrect points Coordinates may be in a table or in working															

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	0.25	B1	cao	
2	20	B1	cao	
3	150	B1	cao	
4	27	B1	cao	
5	645	B1	cao	
6	20	P1 P1 A1	for $30 + 45 \times 10 (= 480)$ or $50 \times 10 - 45 \times 10 (= 50)$ or $50 \times 10 - 30 (= 470)$ for $50 \times 10 - "480"$ cao SCB1 for answer 250 or -250 if P0 scored.	P1P1 for $500 - 450 - 30$ may be seen in stages
7	(a) 9.5 (b) acute (c) 32	B1 C1 B1	for answer in the range 9.3 to 9.7 for acute for answer in the range 30 to 34	Accept answer on the diagram Accept interior angle Do not accept co-interior angle Accept answer on the diagram
8	(a) (3, 1) (b) B at (3, -4) (c) (0, 2)	B1 B1 B1	cao cao cao	Accept a cross without label as long as unambiguous. Accept letter B or dot in place of cross.



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
27	$y = -2x + 3$	M1	for a correct method to find the gradient of the line, eg $\frac{-1-3}{2-0} (= -2)$ or identifies 3 as the intercept in words or in a partial linear equation eg $y = mx + 3$ oe eg $y = 1.5x + 3$ or for $y = [-2]x + c$ or for $y - b = [-2](x - a)$ where (a, b) is a correct coordinate	Just circling 3 is insufficient [-2] can be any numerical value, c must be seen as a letter or a number [-2] can be any numerical value
		M1	for $y = -2x (+ c)$ or for $y = "-2"x + 3, m \neq 0$ or for $(L) = -2x + 3$ or $y - y_1 = -2(x - x_1)$ or for $y - b = "-2"(x - a)$ where (a, b) is a correct coordinate	Award of this mark implies the first M1
		A1	for $y = -2x + 3$ oe	Any correct equation gets 3 marks



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	$y = -\frac{3}{4}x + 3$	M1 A1	for a correct method to find the gradient of the line, eg $\frac{3-0}{0-4} (= -\frac{3}{4})$ or identifies 3 as the intercept in words or in a partial equation or for $y = [-\frac{3}{4}]x + c$ or for $y - b = [-\frac{3}{4}](x - a)$ where (a, b) is a correct coordinate for $y = -\frac{3}{4}x (+c)$ oe or for $y = "-\frac{3}{4}"x + 3, m \neq 0$ or $(L =) -\frac{3}{4}x + 3$ or $y - y_1 = -\frac{3}{4}(x - x_1)$ or $y - b = "-\frac{3}{4}"(x - a)$ where (a, b) is a correct coordinate or for an answer of $y = \frac{3}{4}x + 3$ oe for $y = -\frac{3}{4}x + 3$ oe provided the equation in the required form	Just circling 3 is insufficient $[-\frac{3}{4}]$ must be identifiable as their gradient c must be seen either as a letter or a number Allow eg $y = 3 - \frac{3}{4}x$ A correct equation not in the required form scores M1M1A0
26	$\binom{20}{5}$	M1 A1	for $2\binom{7}{4} + 3\binom{2}{-1}$ or $\binom{14}{8}$ and $\binom{6}{-3}$ or $\binom{20}{y}$ or $\binom{x}{5}$ for $\binom{20}{5}$ or $5\binom{4}{1}$	For M1 condone without bracket and/or with fraction line. Correct answer spoilt scores M1A0

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	CB, CF, CS, TB, TF, TS, LB, LF, LS	B2 (B1)	for fully correct list with no repeats for at least 4 correct combinations, condone repeats and incorrect combinations)	Accept unambiguous abbreviations Accept CB or BC etc
9 (a)	-2, 1	B1	cao	Accept without label provided unambiguous, ignore any lines drawn Accept without label provided unambiguous, ignore any lines drawn
(b)	Point marked at (1, 2)	B1	cao	
(c)	Point marked at (5, 0)	B1	cao	
10	No with reason	C1	No with reason Acceptable reasons: No, the cube root of 27 is 3 (not 9) No, the answer is 3 No, $9 \times 9 \times 9$ is not 27 No, $9 \times 9 \times 9$ is 729 No, $3 \times 3 \times 3$ is 27 No, $27 \div 3 = 9$ and $9 \div 3 = 3$ No, he needs to divide by 3 again No, because you don't divide by 3 for cube root No, 9×9 is 81 which is already more than 27 Not acceptable reasons: No, the cube root is not 9 3 divided by 27 is 9 No because a cube number is a number times by itself 3 times No, because you don't divide by 3	'No' may be implied by an equivalent statement eg 'Jason is wrong' or 'He is not correct'



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
28	(11, 14.5)	P1	for process to work with coordinates, eg $8 - 2 (= 6)$ or $12 - 7 (= 5)$ or eg $(2 + 8) \div 2 (= 5)$ or $(7 + 12) \div 2 (= 9.5)$	Working may be seen on the diagram Allow alternative notation eg (6, 5) or (5, 6) or (5, 9.5) or (9.5, 5) Implied by $\frac{\dots}{8 - 2}$ or $\frac{12 - 7}{\dots}$ even if using $\frac{\text{diff in } x}{\text{diff in } y}$
		P1	for process to use proportion, eg “6” $\div 2 (= 3)$ oe or “5” $\div 2 (= 2.5)$ oe or $2 + \text{“6”} \times 1.5 (= 11)$ or $2 + 9 (= 11)$ oe or $7 + \text{“5”} \times 1.5 (= 14.5)$ or $7 + 7.5 (= 14.5)$ oe or “5” + “6” (= 11) or $8 + \text{“5”} - 2 (= 11)$ oe or “9.5” + “5” (= 14.5) or $12 + \text{“9.5”} - 7 (= 14.5)$ oe or (11, a) where $a \neq 14.5$ or (b , 14.5) where $b \neq 11$	Allow alternative notation eg (3, 2.5) or (2.5, 3) Implied by $8 + \text{“3”} (= 11)$ or $12 + \text{“2.5”} (= 14.5)$
		A1	for (11, 14.5) oe	Award P2 for (14.5, 11)



Paper 1MA1: 1F				
Question	Working	Answer	Mark	Notes
1 (a)		3.65	B1	cao
(b)		2700	B1	cao
2		72	B1	cao
3		42	B1	cao
4		-9 , 2	B1	cao accept either order.
5		47	B1	cao
6		$L = 5a + 3$	M1 M1 A1	for expression $a - 1 + a + a + a + a + 4$ or $L =$ an expression in a for $5a + 3$ or $L = a + a + a - 1 + a + a + 4$ oe for $L = 5a + 3$
7 (a)		(6 , - 2)	B1	cao
(b) i		Correct point	B1	cao for point marked at (2, 9)
(b) ii		Yes with reasoning	B1	Yes with correct substitution $4 \times 2 + 1 = 9$ or by drawing correct line on diagram
(c)		Correct line	B1	for drawing line $x = -2$ cao

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
16	blue 0.15 green 0.2	P1	for $1 - 0.4 - 0.25$ ($=0.35$) oe	May work in percentages, condone missing % sign If the two numbers in the table sum to 0.35 that implies P1 One correct value in the table implies P2 7 can come from 3+4 Accept answers given in decimals, fractions or percentages.
		P1	for using the ratio, eg " $0.35 \div (3 + 4)$ " ($=0.05$) or " $0.35 \times \frac{3}{7}$ " ($=0.15$) or " $0.35 \times \frac{4}{7}$ " ($=0.2$)	
		P1	for a complete process $3 \times "0.05"$ ($=0.15$) and $4 \times "0.05"$ ($=0.2$) or " $0.35 - "0.15"$ " ($=0.2$) or " $0.35 - "0.2"$ " ($=0.15$) or green 0.15, blue 0.2	
		A1	oe	
17	(a) -10, -6, 2, 6 (b) Graph drawn	B2	for 4 values correct -10, -6, (-2), 2, 6, (10)	
		(B1	for 2 or 3 values correct)	
		M1	(ft from (a) if B1 awarded) for at least 5 points correctly plotted.	
		A1	correct graph drawn from $x = -1$ to 4	
18	Correct reflection	B2	correct triangle drawn with vertices (1, 2) (2, 2) (1, -1)	
		(B1	for a correct reflection in the line $y = a$ or a correct reflection in the line $x = 3$, or triangle in correct orientation with 2 of 3 vertices correct)	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	1480	B1	cao	
2	$\frac{7}{10}$	B1	oe fraction	
3	3	B1	cao	
4	Suitable number eg 725	B1	for a suitable 3 digit number ending in 0 or 5	
5	40	B1	cao	
6	-11, -7, -2, 3, 8, 10	B1	for -11, -7, -2, 3, 8, 10	Accept reverse order
7	(a) Hexagon	B1	accept irregular hexagon	Accept unambiguous misspellings
	(b) AF	B1	cao Accept FA	
	(c) AB or EF	B1	AB or EF . Accept BA or FE or both	
8	(a) 3, 2	B1	cao	Allow reasonable hand-drawn attempts
	(b) Point at $(-4, 3)$	B1	cao	
	(c) Circle drawn, centre $(1, -1)$	B2 (B1	fully correct diagram circle drawn with radius 4 cm (any centre) or circle drawn using centre $(1, -1)$ $r \neq 4$ cm)	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	14.5, 21	P1	for process to work with coordinates, eg $4 - (-3) (= 7)$ or $9 - 1 (= 8)$	Accept in reverse order eg $-3 - 4 (= -7)$ and negative distances throughout
		P1	for process to use ratio, eg $"7" \div 2 (= 3.5)$ or $"8" \div 2 (= 4)$ or $"7" \times 3 (= 21)$ or $"8" \times 3 (= 24)$	This mark is implied by 10.5 or 12 or 17.5 or 20
		P1	for complete process to find either the x or the y coordinate of N, eg $"3.5" \times 3 + 4$ or $"4" \times 3 + 9$ or $"3.5" \times 5 - 3$ or $"4" \times 5 + 1$ OR to find both the required distances eg $"3.5" \times 3 (= 10.5)$ and $"4" \times 3 (= 12)$ or $"21" \div 2 (= 10.5)$ and $"24" \div 2 (= 12)$ or $"3.5" \times 5 (= 17.5)$ and $"4" \times 5 (= 20)$	
		A1	oe	
26	600.74	M1	works out decrease for one year, eg $679 \times 4 \div 100 (= 27.16)$ oe or $679 \times (100 - 4) \div 100 (= 651.84)$ oe	Implied by $679 \times 0.12 (= 81.48)$ or $679 \times 0.88 (= 597.52)$
		M1	for compound method, eg $679 \times "0.96"$, $t \geq 2$ or $"651.84" \times "0.96" (= 625.76..)$ or $"651.84" \times "0.04" (= 26.07)$ or for answers in the range 600.71 to 600.74 exclusive	Values may be rounded or truncated
		A1	accept 600.71 or 600.72 or 600.73 or 600.74	If the correct answer is seen and the difference found award M1M1A0



Paper: 1MA1/1F					
Question	Answer	Mark	Mark scheme	Additional guidance	
9	(a)	(5, 2)	B1	cao	
	(b)	(4, −2) marked	B1	for the point (4, −2) unambiguously marked on the grid	Allow without label, provided unambiguous
	(c)	(1, 3)	B1	cao	
	(d)	$y = -4$ shown	B1	for correct single line unambiguously marked	Need not be labelled if clear. Accept a single line drawn freehand of any length. Accept a dotted (or dashed) line
10	Yes (supported)	P1	for an initial process, eg $6 \times 2 (=12)$ or $80 \div 2 (=40 = 0.40)$ oe or $6 \times 0.8 (= 4.80)$ oe or $6 \div 2 (= 3)$		May work in pounds or pence
		P1	for a process using the special offer eg $6 \times "40" (= 240 \text{ or } 2.40)$ oe or $"4.80" \div 2 (= 2.40)$ oe or $2 + "0.40" (= 2.40)$ oe or $"3" \times 0.8 (= 2.40)$		Allow use of inconsistent units for the first 2 marks
		P1	for a complete process to find figures to compare, eg $6 \times 2 + 6 \times "0.40" (= 14.40)$ oe or $15 - "12" - "2.40" (= 0.60 \text{ or } 60p)$		
		C1	for Yes with correct comparable figures, eg Yes and (£)14.4(0) or Yes and (£)0.6(0) or 60p change		Award 0 marks for a correct answer with no supportive working. Answer of 'No' gets C0 irrespective of working, correct or not. Ignore incorrect value for change, if (£) 14.4(0) seen

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
25 (a)	$y = \frac{3}{2}x + 3$	M1	for a correct method to find the gradient of the line, eg $\frac{6-3}{2-0} (= \frac{3}{2})$ or identifies 3 as the intercept in words or in a partial equation or for $y = [\frac{3}{2}]x + c$ or for $y - b = [\frac{3}{2}](x - a)$ where (a, b) is a correct coordinate	Just circling 3 is insufficient $[\frac{3}{2}]$ must be identifiable as their gradient c must be seen either as a letter or a number
		M1	for $y = \frac{3}{2}x (+ c)$ oe or for $y = \frac{3}{2}x + 3, m \neq 0$ or (L =) $\frac{3}{2}x + 3$ or $y - y_1 = \frac{3}{2}(x - x_1)$ or $y - b = \frac{3}{2}(x - a)$ where (a, b) is a correct coordinate	Award of this mark implies the first M1
		A1	oe	Any correct equation gets 3 marks
(b)	Equation	B1	for $y = 5x + c, c \neq 0$ oe	May be in any equivalent form



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	(a)	B1	cao	
	(b)	M1	for an answer of $(0, y)$ where $y \neq -2$ or $(x, -2)$ where $x \neq 0$ or the correct midpoint identified on the grid or $(2 + -2) \div 2$ or $(1 + -5) \div 2$	
		A1	cao SCB1 if M0 scored for $-2, 0$	
	(c)	C1	cao	
9	379.86	P1	for process to work with number of miles or cost, eg $47879 - 47241 (= 638)$ or $47879 \times 47 (= 2250313)$ or $47241 \times 47 (= 2220327)$ or [mileage] $\times 47$	working may be seen in £ or pence throughout [mileage] is any value they consider to be mileage
		P1	for process to work with miles and cost, eg $"638" \times 47 (= 29986)$ or $"638" \times 0.47 (= 299.86)$ or $"2250313" - "2220327" (= 29986)$	
		B1	(indep) for converting between pence and pounds, eg $"29986" \div 100$ or $47 \div 100 (= 0.47)$ or 80×100 OR miles divided by 100, eg $"638" \div 100 (= 6.38)$ or $47879 \div 100 (= 478.79)$ and $47241 \div 100 (= 472.41)$	
		A1	for 379.86	
10	HHH, HHT, HTH, HTT, THH, THT, TTH, TTT	M1	for at least 3 correct outcomes from HHH, HHT, HTH, HTT, THH, THT, TTH, TTT ignoring extras and repeats	May be written in words
		A1	for all 8 outcomes with no extras or repeats	

Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
11		Offer 1	P1	for a process to find the cost of a number of lessons in Offer 1, eg. $24 \times (12 - 1)$ (= 264) or for a process to find 5% (or 95%) of an appropriate amount, eg. 24×0.05 (= 1.20) or 24×0.95 (= 22.80) in Offer 2
		(supported)	P1	for a complete process leading to values to be used for comparison, eg. $24 \times (12 - 1)$ (= 264) and $24 \times 0.95 \times 12$ (= 273.60)
			C1	Offer 1 and correct values, eg. (£)264 and (£)273.6(0) used for comparison
12	Complete methods $3.60 \div 2.5 \times 3.5$ or $3.60 \div 5 \times 7$ or $3.5 \div (2.5 \div 3.6)$ or $\frac{3.5}{2.5} \times 3.6$ or $3.6 \div \frac{2.5}{3.5}$	5.04	M1	for a correct first step to find the cost of a unit of weight (eg. 1 kg or 0.5 kg) eg $3.60 \div 2.5$ (= 1.44) or $3.60 \div 5$ (= 0.72) or a complete alternative method
			A1	for 5.04 (accept £5.04p)
13	(a)	(-2) -1.5 -1 -0.5 (0) 0.5	B2 [B1]	for a fully correct table for 2 or 3 correct entries]
	(b)	Correct line	M1	for correctly plotting at least 5 of their points (provided B1 scored in part (a)) or for a straight line with gradient 0.5 or for a straight line through (0,-1) with a positive gradient
			A1	for a correct line between $x = -2$ and $x = 3$
	(c)	2.6	B1	for answer in the range 2.5 to 2.7 or fit a single straight line with positive gradient



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
24	(22, 20)	P1	for process to find width or height of diagram eg $38 - 6 (= 32)$ or $36 - 7 (= 29)$	Figures may be shown on the diagram
		P1	for process to find length of side of square eg $"32" \div 4 (= 8)$ or process to find half width of diagram eg $"32" \div 2 (= 16)$	
		P1	for process to find x coordinate eg $6 + 2 \times "8" (= 22)$ or $6 + "16" (= 22)$ or $(6 + 38) \div 2 (= 22)$	If $(6 + 38) \div 2$ leads to an answer other than 22, award P2 only
		P1	for process to find y coordinate eg $36 - 2 \times "8" (= 20)$ or $36 - "16" (= 20)$ or $7 + 8 + "29" - 3 \times "8" (= 20)$	
		A1	cao SC: award 4 marks for (20, 22)	Award for P3 for (22, y) or (x, 20) or $x = 22$ or $y = 20$

Paper 1MA1: 1F						
Question	Working	Answer	Mark	Notes		
28		Shows reasoning to reach $y=3$	M1	forms equation eg $2x + 6 = 5x - 9$	$48 \div 3 (=16)$	$3(2x + 6) = 48$ or $3(5x - 9) = 48$, condone missing bracket
			M1	isolates x and number terms $3x = 15$	forms equation $2x+6="16"$ or $5x - 9 = "16"$	Isolates x and number terms $6x = "30"$ or $15x = "75"$
			M1	substitutes "5" into side length eg $2 \times 5 + 6 (=16)$	isolates x and number terms $2x = "10"$ or $5x = "25"$	forms the second equation
			A1	$48 \div 16 = 3$ or $16 \times 3 = 48$	shows $x=5$ for both solutions	$x=5$ from 2 different equations.
29		Comment	B1	for correct mathematical comment eg line segments not a curve or should draw freehand or should not use a ruler, or should be a curve NB Do not accept statements about scale or plotting accuracy.		
30		4	M1	for a complete method eg $2.80 \times 100 \div (100-30)$ oe or $2.80 \div 0.7$ oe or for build up method but must show all intermediate steps unless all figures are correct eg $2.8 \div 7 = 0.4$ and $"0.40" \times 10 (=4)$		
			A1	cao		



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
25 (a)	F	B1	cao	
(b)	D	B1	cao	
26	Shown (supported)	M1 M1 A1	for method to find at least two terms, eg $2 \times 4^2 - 1 (= 31)$ and $40 - 3^2 (= 31)$ for generating at least three correct terms of each sequence for generating at least the terms 1, 7, 17, 31, 49 of the first sequence and at least the terms 39, 36, 31, 24, 15, 4 of the second sequence	1 7 17 31 49 71 97 127 161 199 39 36 31 24 15 4 -9
27	4.56×10^{-2}	M1 A1	for $0.000000342 \div 0.0000075$ OR for 0.0456 oe eg 0.456×10^{-1} or 45.6×10^{-3} or $\frac{57}{1250}$ OR for an answer of 4.56×10^n cao	
28	6	M1 M1 A1	for $720 \div 40 (= 18)$ or $720 \div 30 (= 24)$ for a complete process eg $(720 \div 30) - (720 \div 40)$ or " 18 " $\times$ $4/3$ – " 18 " or " 24 " – " 24 " $\times$ $3/4$ cao	

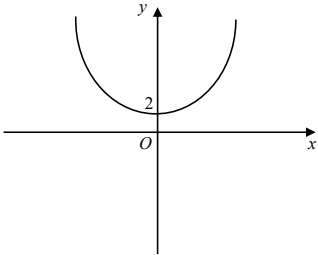
Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
19 (a)	$x^2 - 4x$	B1	cao	
		B1	cao	
		M1	for a correct first stage, eg. expanding brackets, $7 \times f - 7 \times 5 (= 28)$ oe or for division of both sides by 7, eg. $\frac{7(f-5)}{7} = \frac{28}{7}$	
		A1	cao	
20	$3n - 2$	B2	for $3n - 2$ oe	Accept a different variable, eg. $3x - 2$ $n = 3n - 2$ gets B1 only $n + 3$ gets NO marks
		(B1)	for $3n + k$ where $k \neq -2$ or is absent unambiguously shown)	
21	Shown	M1	for conversion to improper fractions eg. $\frac{7}{3}$ or $\frac{15}{4}$	Need not be shown with operators
		M1	(dep) for method to multiply fractions, eg. $\frac{7 \times 15}{3 \times 4} (= \frac{105}{12})$ or $\frac{28 \times 45}{12 \times 12} (= \frac{1260}{144})$ oe	
		C1	for complete working showing each stage as far as $\frac{35}{4}$ or $8\frac{9}{12}$	
22	B C D A	B2	cao	
		(B1)	for two or three correct)	
23	A & D	B1	cao	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	12	P1	for a process to find the fifth term eg $3a + 5a (=8a)$	[8a] allow use of what is clearly indicated as the missing term $\frac{228}{19}$ or $\frac{228}{1+2+3+5+8}$ scores P1 P1 $\frac{228}{1+2+3+5+8}$ scores P0 P1
		P1	for setting up the equation eg $a + 2a + 3a + 5a + [8a] = 228$	
		A1	cao	
26	(a)	P1	for $1 - 0.05 - 0.15 (=0.8)$	Award this mark for any two probabilities that sum to 0.8
		A1	oe	
	(b)	M1	$18 \div 0.15$ oe or $6 + 18 + a + b$ where $a + b = 96$	
		A1	cao	
27		P1	for finding the area of the triangle eg $0.5 \times 8 \times 8 (=32)$	Accept rounded or truncated figures
		P1	for finding the area of the circle $\pi \times 8 \times 8 (=201.06..)$	
		P1	for finding the area of the sector eg $\frac{1}{4} \times \pi \times 8^2$ or "201.06.." $\div 4 (=50.26..)$	
		A1	for an answer in the range 18.2 to 18.3	
28	Sketch	M1	correct shape in one of the required quadrants or correct graph where the lines touch the axes	If the answer is given within the range but then rounded incorrectly award full marks.
		A1	fully correct shape	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
24 (a)	63	B1	for 63, accept $3 \times 3 \times 7$ or $3^2 \times 7$	(A =) $2^2 \times 3^4 \times 7$ scores 0 marks
		M1	for at least two of 2^2 , 3^4 , 7^2 or shows at least 3 multiples of 2268, eg 2268, 4536, 6804 and at least 3 multiples of 441, eg 441, 882, 1323	
		A1	for 15876 or $2^2 \times 3^4 \times 7^2$ oe	
25	65	P1	for a correct process to find the number of seconds, eg $67\,205\,600 \div 11.9$ (= 5 647 529.4...) or for a correct process to convert between seconds and days, eg $24 \times 60 \times 60$ (= 86 400) oe, may be seen in stages or $11.9 \times 60 \times 60 \times 24$ (= 1 028 160)	Note that this mark may be awarded at any stage in the working. If a correct answer within the range is shown in working but incorrectly rounded award full marks.
		P1	for a complete process, eg “5 647 529.4...” $\div$ “86 400” or $67\,205\,600 \div$ “1 028 160”	
		A1	accept answers in the range 65 to 65.4 or 66	
26 (a)	(1, -3)	B1	cao	
		B1	for an answer in the range -0.8 to -0.6 or 2.6 to 2.8	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
28	Graph sketched	B2	for fully correct graph with y-intercept labelled	
				
		(B1	for the general shape in the correct orientation incorrectly positioned or graph with a y-intercept clearly labelled at 2)	
29	26	M1	for continuing the sequence to find the 5 th term, eg $3a + 4a + 4a (= 11a)$	
		M1	(dep M1) for equating the fifth term with 286, eg $3a + 4a + 4a = 286$ oe or $286 \div "11"$	May be seen next to sequence Award M2 for a correct numerical statement relating 26, 11 and 286
		A1	cao	An answer of 26 coming from an incorrect method, eg $a + 3a + 4a + 7a + 11a = 26a$ scores M1 only unless numerical statement relating 26, 11 and 286 with no a is seen

Paper: IMA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
28	8.5	P1	for process to use the area of $PQRS$ to find the length of PQ , eg $10y = 45$ or $45 \div 10 (= 4.5)$	Sets up equation for area
		P1	for process to use the perimeter of $ABCD$, eg $2x + 2 \times "4.5" = 26$ or $26 - 2 \times "4.5" (= 17)$ or $26 \div 2 (= 13)$	Uses perimeter of $ABCD$
		P1	for process to use length of BC to find length of AB , eg solves $2x + 2 \times "4.5" = 26$ or $(26 - 2 \times "4.5") \div 2$ or $"13" - "4.5"$	
		A1	for 8.5 or $8\frac{1}{2}$	Accept $\frac{17}{2}$
29	(a)	B1	cao	Brackets are given on the answer line, ignore any extra brackets seen
	(b)	B2	for both correct answers	
		(B1)	for one correct solution or $(x + 1)(x - 3)$ or $(-1, 3)$	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
27	Rachel supported	P1	for process to begin to work with percentage for year 1 for Tamsin or Rachel, eg 150000×0.04 (= 6000) oe or 150000×1.04 (= 156000) oe or 160000×0.015 (= 2400) oe or 160000×1.015 (= 162400) oe	May be implied by 12000 or 4800 or 162000 or 164800
		P1	for process to use compound interest for Tamsin or Rachel, eg " 156000×0.04 (= 6240) oe or " 156000×1.04 (= 162240) oe or " 162400×0.015 (= 2436) oe or " 162400×1.015 (= 164836) oe or 1.04^2 (= 1.0816) or 1.015^2 (= 1.030225) OR for process to begin to work with percentage increase for Tamsin and Rachel for one year, eg 150000×1.04 (= 156000) oe and 160000×1.015 (= 162400) oe	values may be rounded or truncated to 3 sf May be implied by 162000 and 164800
		P1	for full process to find figures to compare, eg Tamsin for 2 years and Rachel for 2 years eg 150000×1.04^2 (= 162240) oe and 160000×1.015^2 (= 164836) oe OR Tamsin for 2 years and Rachel for 1 year, eg 150000×1.04^2 (= 162240) oe and 160000×1.015 (= 162400) oe	Other comparisons are possible
		C1	for Rachel with supporting figures, eg 162240 and 164836 or 162240 and 162400 or other valid conclusion with supporting comparable figures	Note that the figure used to compare for Rachel can be the figure after 2 years or after 1 year
28	B, D, E, C, A	B3	for all correctly matched	
		(B2	for 3 or 4 correctly matched)	
		(B1	for 2 correctly matched)	

Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
20		1.01	P1 P1 P1 A1	fruit syrup 15×1.4 (= 21) or water 280×0.99 (= 277.2) or apple juice 25×1.05 (= 26.25) (dep P1) for complete process to find the total mass e.g. "277.2" + "26.25" + "21" (= 324.45) or a weighted density eg $15 \times 1.4 \div 320$ (= 0.065625) or $280 \times 0.99 \div 320$ (= 0.86625) or $25 \times 1.05 \div 320$ (= 0.08203125) (dep P2) for complete process to find the density eg "324.45" $\div 320$ (=1.01..) or "0.065625" + "0.86625" + "0.08203125" (= 1.0139..) 1.01 to 1.014
21		Shown (supported)	M1 C1	method to divide a pair of corresponding sides, eg $7.5 \div 3$ (= 2.5) or $3 \div 7.5$ (= 0.4), or states scale factor is 2.5 or 0.4 or method to work out the size of an angle, eg $\tan^{-1}\left(\frac{7.5}{10}\right)$ (= 36.8 to 36.9) shows or states that all sides are enlarged by the same factor or works out a pair of corresponding angles and states that the two triangles have the same angles
22 (a)		12, 4, 2, 1.2, 1	B2 (B1)	for fully correct table (allow fractions or decimals) for 3 or 4 of 12, 4, 2, 1.2, 1
(b)		Correct curve	M1 A1	ft (dep on B1 in (a)) for plotting at least 6 points from their table correctly for a fully correct curve



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
24 (a)	13, (6), 5, 4, -3	B2	for all 4 values correct	Accept a freehand curve drawn that is not made of line segments Line sections outside the required range can be ignored.
		(B1	for 2 or 3 correct values)	
		M1	ft (dep on B1) for plotting at least 4 of the points from their table correctly	
(b)	Correct graph	A1	for a fully correct curve drawn	
25	99.5	M1	for $\sin(34) = \frac{x}{178}$ oe or alternative method to find x	If an answer in the range 99.5 to 99.7 is given in the working space then incorrectly rounded, award full marks
		A1	for answer in range 99.5 to 99.7	
26	$\begin{pmatrix} -9 \\ 14 \end{pmatrix}$	M1	for $2\begin{pmatrix} 3 \\ 4 \end{pmatrix} - 3\begin{pmatrix} 5 \\ -2 \end{pmatrix}$ or $\begin{pmatrix} 6 \\ 8 \end{pmatrix}$ and $\begin{pmatrix} 15 \\ -6 \end{pmatrix}$ or $\begin{pmatrix} -9 \\ y \end{pmatrix}$ or $\begin{pmatrix} x \\ 14 \end{pmatrix}$	May be seen in two separate calculations eg $2 \times 3 + -3 \times 5$ and $2 \times 4 + -3 \times -2$ Condone incorrect notation if method is clear for this mark only
		A1	cao	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
22	8.73	M1	for a correct trig statement, eg $14.5 \times \cos 53$ or $\cos 53 = x \div 14.5$	Can use a combination of skills but must have only one unknown in x to score this mark If an answer is given in the range in working and then rounded incorrectly award full marks.
		A1	answer in the range 8.726 to 8.73	
23	7318.15	M1	for a correct first step eg working out increase for one year $7000 \times (100 + 3) \div 100 (= 7210)$ oe or $7000 \times 3 \div 100 (= 210)$ oe or find the multiplier for both years eg $(100 + 3) \div 100 \times (100 + 1.5) \div 100 (= 1.04545)$	7315 or 315 implies M1
		M1	for a compound method, eg $7000 \times (100 + 3) \div 100 \times (100 + 1.5) \div 100$ oe or “7210” $\times 1.5 \div 100$ or $(= 108.15)$ oe	318.15 implies M1M1A0
		A1	cao	
24	(a) 4	B1	for 4	Condone (0,4) or 0,4 Accept both solutions given as a coordinate for M1 eg (5.2, 0.8) or (0.8, 5.2) or (5.2, 0) and (0.8, 0)
	(b) (3, -5)	B1	cao	
	(c) 5.1 to 5.3 and 0.7 to 0.9	M1	for a correct method, eg marking both intercepts with x-axis or one correct solution	
		A1	for answers in the range 5.1 to 5.3 and 0.7 to 0.9	
25	(a) 1.25	B1	for 1.25 or $\frac{5}{4}$ or $1\frac{1}{4}$	Accept 4749.9 or 4749.99(...)
	(b) 4650 and 4750	B1	for 4650 in the correct position	
		B1	for 4750 in the correct position	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
20 (a)	4 0 -2 -2 0 4	B2	for all 4 correct values	Accept a freehand curve drawn that is not made of line segments.
		(B1)	for 2 or 3 correct values)	
(b)	Graph	M1	fit (dep B1) for plotting at least 4 points correctly	
		A1	for a fully correct curve drawn	
21	Reflection $y = -x$	B1	for reflection	Score B0 for more than one transformation
		B1	for line $y = -x$ oe	
22 (a)	$13y - 1$	M1	for method to expand one bracket or collect like terms eg $3 \times 2y - 3 \times 5 (= 6y - 15)$ or $7 \times y + 7 \times 2 (= 7y + 14)$ or $3 \times 2y + 7 \times y (= 6y + 7y)$ or $3 \times -5 + 7 \times 2 (= -15 + 14)$	May be implied by $13y$ or -1
(b)	$3x(2x + 5)$	A1	oe	
		B2	oe	May be seen in different equivalent form
		(B1)	for $3(2x^2 + 5x)$ or $x(6x + 15)$ or $3x(ax + b)$	
(c)	$g = \frac{f-11}{3}$	M1	for correct first step to rearrange eg $f-11 = 3g + 11 - 11$ or $f-11 = 3g$ or eg $\frac{f}{3} = \frac{3g}{3} + \frac{11}{3}$ or $-3g = 11 - f$ or answer ambiguously shown, eg $g = f-11 \div 3$ or given as $\frac{f-11}{3}$	
		A1	oe	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
24 (a)	5, (0), -3, -4, (-3), 0, 5	B2	for all 5 correct values	Accept freehand curves drawn that are not line segments Ignore anything drawn outside the required range
		(B1)	for at least 2 correct values)	
	Graph drawn	B2	for a fully correct graph	
		(B1)	ft (dep on B1 in (a)) for plotting at least 5 of the points from their table correctly)	
25]	Yes (supported)	P1	for start to a process to find a percentage increase, eg $85 - 76 (=9)$ or $66 - 65 (=1)$ or $\frac{85}{76} (=1.118...)$ or $\frac{66}{65} (=1.015...)$	Accept use of rounded and truncated figures for all marks. May work in decimals or equivalent proportions throughout
		P1	for process to find a % increase, eg $\frac{9}{76} \times 100 (= 11.84...)$ or $\frac{1}{65} \times 100 (= 1.53...)$ or $\frac{85}{76} \times 100 - 100 (= 11.84...)$ oe $\frac{66}{65} \times 100 - 100 (= 1.53...)$ oe	
		P1	for processes to find both % increases, eg $\frac{9}{76} \times 100 (= 11.84...)$ and $\frac{1}{65} \times 100 (= 1.53...)$ or $\frac{85}{76} \times 100 - 100 (= 11.84...)$ oe and $\frac{66}{65} \times 100 - 100 (= 1.53...)$ oe	
		C1	for Yes supported by correct figures, eg $11(.842...) \div 1.5(38...) = 7.3$ to 8 or $11(.842...) \text{ and } 1.5(38...) \times 7 = 10(.766...)$ or $11(.842...) \div 7 = 1.57$ to 1.7 and $1.5(3...)$ or $0.11(842...) \text{ and } 0.10(766...)$	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
22 (a)	2, -4, 2, 8	B2	all 4 values correct	
		(B1	for 2 or 3 correct values)	
(b)	Graph	M1	(dep B1) for at least 5 points plotted correctly ft from part a	Accept freehand curves drawn that are not line segments; there must be some attempt to draw the minimum point below $y = -4$.
		A1	for a fully correct curve drawn	
(c)	-2.6 or 1.6	B1	for 1 correct value, ft a non linear graph	Award for -2.6 or 1.6 or both values but do not award the mark if a correct value is given with an incorrect value. Accept 1.56 or -2.56 Note for ft to be applied the graph may be joined by line segments.

Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
20 (a)	0.4 oe	P1	for $1 - 0.3 - 0.1 (= 0.6)$ or $0.3 + 0.1 + 2x + x = 1$	Award this mark for any two probabilities that sum to 0.6 Allow P1P1A0 for $P(\text{green}) = 0.4$ Award P1P1A0 for 0.4 with incorrect subsequent working eg $\frac{0.4}{0.6}$ If no answer on answer line then check table A0 for $\frac{0.4}{1}$
		P1	for $"0.6" \div 3 (= 0.2)$ or $3x = "0.6"$	
		A1	for 0.4 oe	
	(b) 150	M1	for complete method to find the total number of counters eg $45 \div 0.3$ or $45 \div 3 \times 10$ oe or $45 + 45 \div 3 + 45 \div 3 \times 4 + 45 \div 3 \times 2 (= 45 + 15 + 60 + 30)$	
		A1	cao	
21 (a)	(2), -2, (-4), -4, -2, 2	B2	for all 4 values correct	Accept a freehand curve drawn that is not made of line segments Curve must not have a horizontal segment between $(-1, -4)$ and $(0, -4)$ Ignore anything drawn outside the required range
		(B1	for 2 or 3 correct values)	
	Graph drawn	B2	for a fully correct graph	
		(B1	fit (dep on B1 in (a)) for plotting at least 5 of the points from their table correctly)	
	(c) -0.5, -4.25	B1	fit their graph with a single turning point or for x coordinate = -0.5 and y coordinate = -4.25 oe	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
23	3 : 5	P1 P1 P1 P1 A1	for process to find 20% or 120% of the cost, eg 8500×0.2 (= 1700) oe or 8500×1.2 (= 10 200) oe for process to find total cost of payments, eg 12×531.25 (= 6375) for complete process to find value of deposit, eg "10 200" – "6375" (= 3825) or $8500 - "6375"$ (=2125) and "2125" + "1700" (=3825) OR the deposit as a proportion of the total cost, eg $1 - \frac{6375}{10200}$ ($=\frac{3}{8}$) for finding a correct un-simplified ratio, eg "3825" : "6375" oe or 5:3 or $1.6 : 1$ or $\frac{5}{3} : 1$ Accept 1: 1.6, 1: $\frac{5}{3}$	When partitioning all figures quoted must be correct or a full method shown eg $10\% = 8500 \div 10$ (=850) and $20\% = "850" + "850"$ (=1700) May be seen as a fraction of the total eg $\frac{3825}{10200}$ ($=\frac{3}{8}$) Figures at this stage must be expressed as part of a ratio eg 51:85, $\frac{3}{8} : \frac{5}{8}$ Ignore consistent units
24	(a) 0, -4, -6, -4, 0 (b) Graph (c) 2.6 and -1.6	B2 (B1) M1 A1 M1 A1	fully correct figures At least 2 correct figures) (dep B1) for at least 5 points correctly plotted ft from (a) fully correct graph for $y = -2$ drawn or intersections with $y = -2$ or $y = x^2 - x - 4$ drawn or 1 correct value ft a quadratic graph or for answers in the range 2.5 to 2.7 and -1.5 to -1.7	Must be a curve If answers stated as coordinates, award M1 for both coordinates and M0 for one coordinate



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
23 (a)	80	M1 A1	for a complete method eg $\frac{20}{15} \times 60$ or 20×4 or $20 \div \frac{1}{4}$ cao	Can be implied by a distance of 25km drawn on the graph
(b)	Travel graph	M1 C2 (C1)	for method to find distance travelled in last 20 minutes, eg $75 \times \frac{20}{60}$ (= 25) for a fully correct travel graph for horizontal straight line from (10 15, 20) to (10 25, 20) or for a line of the correct length and gradient to indicate a speed of 75km/h eg straight line from (10 25, 20) to (10 45, 45))	
24 (a)	(10), 5, (2), 1, 2, (5), 10	B2 (B1)	for all 4 values correct for 2 or 3 correct values)	
(b)	Graph	M1 A1	ft (dep on B1) for plotting at least 5 of their points correctly for a fully correct curve drawn	Accept a freehand curve drawn that is not made of line segments
(c)	-0.65 to -0.8 and 2.65 to 2.8	M1 A1	for $y = 4$ drawn or intersection with $y = 4$ or $y = x^2 - 2x - 2$ drawn or 1 correct value (ft a quadratic) ft a quadratic graph or for answers in the range 2.65 to 2.8 and -0.65 to -0.8	If answers stated as coordinates, award M1 for both coordinates and M0 for one coordinate



Paper: 1MA1/1F					
Question	Answer	Mark	Mark scheme	Additional guidance	
27	132	M1	for finding an exterior angle eg $360 \div 6 (= 60)$ or $360 \div 5 (= 72)$ or an interior angle eg $180 \times 4 \div 6 (= 120)$ or $180 \times 3 \div 5 (= 108)$	Angles may be shown on the diagram Only award this mark for an angle that is not contradicted	
		M1	for a complete method eg $360 - "120" - "108"$ or $"60" + "72"$		
		A1	cao	Answer only award no marks	
28	(a)	5,(1),(-1),-1,1,5	B2	for all 4 values correct	Accept a freehand graph drawn that is not made of line segments Ignore anything drawn outside the required range ft their graph for this mark Accept these coordinates reversed
			(B1)	for 2 or 3 correct values)	
	(b)	Graph drawn	B2	for a fully correct graph	
			(B1)	ft (dep on B1in (a)) for plotting at least 5 of the points from their table correctly)	
	(c)	0.3 to 0.5 and 2.5 to 2.7	M1	for a correct method, eg marking intercepts with x-axis or one correct solution or both solutions given as a coordinates, eg (0.4, 2.6) or (0.4, 0) and (2.6, 0)	
			A1	for answers in the range 0.3 to 0.5 and 2.5 to 2.7 or ft their graph with at least 2 solutions	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
24 (a)	(6) 2 (0) 0 (2) 6	B2 (B1)	for all 3 values correct for 1 or 2 correct values)	
(b)	Graph drawn	B2 (B1)	for a fully correct graph ft (dep on B1 in (a)) for plotting at least 5 of the points from their table correctly)	Accept a freehand curve drawn that is not made of line segments Ignore anything drawn outside the required range
(c)	−1.7 to −1.5 and 2.5 to 2.7	M1 A1	for drawing the line $y = 4$ or reading off intersections where $y = 4$ or one correct solution or both solutions given as coordinates, eg (−1.6, 2.6) or (−1.6, 4) and (2.6, 4) for answers in the range −1.7 to −1.5 and 2.5 to 2.7 or ft their graph with at least 2 solutions	ft their graph for this mark Accept these coordinates reversed Algebraic methods score 0 marks



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
23	55	P1	for process to find the sum of the interior angles of a pentagon, eg. $180 \times (5 - 2) (= 540)$ oe	Can be implied by the shape correctly divided into triangle and quadrilateral or three triangles with correct angle sums marked.
		P1	for the start to a process of giving each angle in a common form, eg. $d = 3c$ or $e = 2c$ or $x, 3x, 2x$	Can be implied by division by 7 or 1, 1, 3, 2 given in a ratio eg 1 : 2 : 1: 3
		P1	for process to find the value of c , eg $([540] - 155) \div 7$ oe or for a correct equation in one variable, eg $c + 155 + c + 3c + 2c = [540]$ oe	Where [540] is what they believe to be the angle sum of the pentagon.
		A1	cao	
24	Rate of change of volume	C1	for a correct explanation Acceptable examples The rate of water poured Speed of pouring water out from the tank How fast the water is being used (in the tank over time) Amount of water decreasing in the tank each second Not acceptable examples Negative correlation / negative gradient Amount of water decreasing in the tank in seconds As time increases the volume of water in the tank decreases It is negative, the volume of litres is going down It represents the deceleration or changing speed	Allow amount of water increasing in the tank each second



Paper: IMA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)	10	B1	cao	
	30	M1	for using the graph to take one correct reading	May be shown on graph
		A1	30 or ft from correct use of graph	
13	4 : 1 : 2	M1	for start to express the statements as a ratio eg 4 : 1, 1 : 4, 1 : 2 or 2 : 1 with clear and correct link to Azmol, Ryan, Kim	Allow any equivalent ratio, integers only May be seen as part of an incorrect answer. May be seen as integer multiples of these algebraic expressions. Any letter may be used. Accept 8 : 2 : 4 or equivalent ratios involving integers
		A1	4 : 1 : 2 oe	
		(SCB1	3 integer numbers in correct ratio but no ratio notation, eg 4, 1, 2 or 20, 5, 10)	
14	shown	M1	for method to find angle ADC , eg $180 - 75 (= 105)$	Must be clear link to angle ADC , may be marked on diagram
		M1	for angle $BCD = 50$	
		M1	for method to find angle ABC , eg $360 - 100 - 50 = "105"$	Must be clear method/explanation shown. Angle marked on diagram is not sufficient. Underlined words need to be shown; reasons need to be linked to their method
		C1	(dep M3) for angles ADC , BCD and ABC correct and at least 2 appropriate reasons, eg vertically <u>opposite angles</u> are equal or <u>vertically opposite angles</u> are equal, <u>angles</u> on a straight <u>line</u> add to <u>180°</u> , <u>angles</u> in a <u>quadrilateral/kite</u> add up to <u>360°</u> ; <u>angles</u> at a <u>point</u> add up to <u>360°</u>	



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	16	C1	starts to interpret information eg 75 or 29 in the correct place	May be seen as numerators of fractions for the first 2 marks.
	45 29			
	75 14	C1	for $120 - 75 (= 45)$ and $"45" - 29 (= 16)$	Could be seen in working or on the diagram
	61	C1	Complete and correct frequency tree	
(b)	$\frac{29}{120}$	B1	for $\frac{29}{120}$ or ft "29" from part (a)	Accept any equivalent fraction, decimal form 0.24(166...) or percentage form 24(.166..) Ignore subsequent incorrect attempts to write the correct answer in a different form.
16 (a)	45	B1	cao	
(b)	50	M1	for an attempt to find the gradient eg $"25" \div "0.5"$ ft their readings from the travel graph; use of speed-time formula eg $25 \div 30$ (ignore units if shown)	could be shown in working or on the graph using any acceptable triangle; could be shown by multiples of 25, 0.5 or multiples of ft figures
		A1	cao	
17	18	P1	for process to solve $x - 1 = 2$, eg. $x = 2 + 1 (= 3)$ or for $2x = 6$	Can award mark for $3 - 1 = 2$
		P1	for 2×9	
		A1	cao	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
11 (a)	19	B1	cao	
	12.4 to 12.8	M1	for a complete method, eg attempts to read from the graph at a factor of 80 and scales up to 80 or attempts to read from the graph at two numbers that sum to 80 and finds the sum of their readings or 1 stone = “6”kg and $80 \div “6”$	
		A1	for an answer in the range 12.4 to 12.8 or ft correct reading from graph	
12	0.35	P1	for $\left(\frac{1}{10} + \frac{3}{5}\right) \div 2$ or 0.1 and 0.6 or 10(%) and 60(%) or 35(%) or for converting to equivalent fractions with a common denominator eg $\frac{1}{10}$ and $\frac{6}{10}$	
		A1	for $\frac{7}{20}$ oe or 0.35	



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
9 (a)	30	B1	cao	
(b)	42	B1	cao	
(c)	$\frac{1}{20}$	B1	for $\frac{1}{20}$ or any equivalent fraction or 0.05	
10 (a)	80	B1	cao	“Yes” may be implied from wording Ignore any references to actual readings from the graph
(b)	8	B1	cao	
(c)	Yes and reason	C1	for yes and reason Acceptable examples Yes, because 27 is greater than 7 Yes, because the drop is 20 more Yes, the gradient is steeper (in the first 3 mins) and is then less steep (in the last 3 mins) Yes, because the drop is 20 less in the last 3 mins Yes, because the drop is more Not acceptable examples No Yes, because the drop is 20 less	
11	110	M1 M1 A1	for use of angles in a quadrilateral add to 360°, eg $360 - 130 - 95 - 65 (= 70)$ for $180 - “70”$ or for $(130 + 95 + 65) - 180$ cao	May be seen in diagram or as a sum to 360°. $(130 + 95 + 65) - 180$ gains M2



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)	$\frac{5}{11}$	M1	for $\frac{5}{n}$ where $n > 5$ or $\frac{m}{11}$ where $m < 11$	where "11" comes from 5+2+4
		A1	for $\frac{5}{11}$ oe	Accept any equivalent fraction, decimal form 0.45(45...) or percentage form 45(.45...)%
		B1	for 0.7 oe	Accept any equivalent fraction eg $\frac{7}{10}$ or percentage form eg 70%
17	accurate drawing	M1	for drawing a side of length 6cm	
		A1	for correct triangle	
18	258 to 275	M1	for taking a correct reading from the graph that shows conversion of an amount in \$ to £	
		M1	for a complete method eg attempts to read from the graph at using numbers that sum to 345 and finds the sum of their readings eg $6 \times 50 + 45$	Must be a complete method to get to 345
		A1	for answer in the range 258 to 275	Condone incorrect money notation if the meaning is clear
19 (a)	140	M1	for complete method eg $56 \div 40 \times 100$	May be seen in different ways, eg 2.5×56
		A1	cao	
	32	M1	for method to find percentage, eg $\frac{18}{56} \times 100 (=32.14...)$	
		A1	for an answer in the range 32 to 32.2	



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)	1.844977205	M1	for 3.403(940887) or 3.717(526059) or 2.014(944168) or 1.84(...) or 1.8(...)	Accept consistent use of a comma to indicate a decimal point
		A1	for 1.844(977205)	Answer must be given to at least 3 decimal places rounded or truncated
		B1	for 1.84 or ft from (a) provided answer to (a) has at least 3 dp	
13 (i)	21	M1	for $180 - 75 - 84$	
		A1	cao	Angle may be indicated on the diagram
		C1	for reason that <u>Angles</u> on a straight <u>line</u> add up to 180	The key words underlined must be present There should be no incorrect reasons given
14 (a)	15	B1	14 to 16	
		M1	for a complete method, eg $30 \times (36 \div 2)$ or $45 \times (36 \div 3)$ or $60 \times (36 \div 4)$ or ft "hourly rate from (a)" $\times 36$	May be seen using a complete build up method for "45" allow 44 to 46 ft for accuracy
		A1	for 540 or ft (a)	Condone use of mixed rates eg $75 \times 7 + 16 = 541$
15	$\frac{4}{9}, \frac{3}{5}, \frac{5}{8}, \frac{2}{3}$	M1	converts into decimals or percentages or equivalent fractions, at least 2 conversions correct or for any 3 fractions in correct order	0.44(...), 0.6, 0.625, 0.66(...)
		A1	for $\frac{4}{9}, \frac{3}{5}, \frac{5}{8}, \frac{2}{3}$	Accept in reverse order for this mark Accept expressed in equivalent decimals or percentages or fractions or in mixed numerical form

Paper: 1MA1/3F					
Question	Answer	Mark	Mark scheme	Additional guidance	
13	(a)(i)	40	B1	cao	Underlined words need to be shown.
	(ii)	Reason	C1	Reason given <u>Angles</u> in a <u>quadrilateral</u> add up to 360. Accept “4-sided shape”	
	(b)	Explanation	C1	Explanation Acceptable examples 190 > 180 It does not add up to 180 80+60+50=190 Angles in a triangle add up to 180 Not acceptable examples One of the angles needs to be less You cannot draw this triangle	
14	(a)	30	B1	cao	Condone some inaccuracy in reading from the graph, which should be given to within the nearest 50g
	(b)	2238 to 2296	M1	for a complete method eg attempts to read from the graph at a factor of 80 and scales up to 80 using a correct scale or attempts to read from the graph using numbers that sum to 80 and finds the sum of their readings or attempts to read from the graph a number that they then go on to scale up to 80 using a correct scaling factor	
			A1	for an answer in the range 2238 to 2296	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)	170	B1	for answer in the range 167 to 173	
	35	M1	for correctly using readings from the graph as a factor of 1000 from the grams scale, eg 200×5 or 100×10 or 20×50 or 250×4 or for method to use multiples of grams and corresponding ounces readings, eg $1000 \div \text{"answer to (a)"} \times 6$ or $1000 \div \text{grams} \times \text{ounces}$ oe	May be seen as a build-up method using multiple readings that can be read from the graph but must total 1000 grams (ounces, grams) is a point on the line
		A1	for an answer in the range 34 to 36	
17	Region R shown	C1	for arc drawn, radius 4 cm, centre A	Allow free hand drawing
		C1	for perpendicular bisector of CB drawn	Allow free hand drawing
		C1	for fully correct region R shown (inside the arc from A and left of the bisector)	Ignore absence of "R" if region is unambiguously shown eg by shading
18	12	P1	for a beginning process, eg $1800 - (1800 \times 0.56)$ oe or $1800 \times (1 - 0.56)$ (= 792) or $1800 \div 100 \times 56 \div 66$ (= 15.272...) or $1800 \div 66$ (=27.272...) or $[44\%] \div 66$	[44%] is the value they clearly believe to be 44% of 1800
		P1	for a complete process, eg "792" $\div$ 66 or "27.272..." $\times$ (1 – 0.56) oe or "27.272..." – "15.272..."	
		A1	cao	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
13	Shown	M1	for a method leading to the evaluation of another angle, ($BAC =$) $360 - 310 (= 50)$ or ($ACB =$) $180 - 115 (= 65)$	Angles may be seen on diagram
		M1	for a method to find at least 2 angles, eg ($BAC =$) $360 - 310 (= 50)$ and ($ACB =$) $180 - 115 (= 65)$	
		C2	(dep M2) $CBA = 65^\circ$ and statement and appropriate angle reasons, eg statement $ACB = CBA (= 65^\circ)$ or two angles are equal (so it is isosceles) and <u>angles</u> at a <u>point</u> add up to 360, <u>angles</u> on a straight <u>line</u> add up to 180, <u>angles</u> in a <u>triangle</u> add up to 180, OR (dep M2) $CBA = 65^\circ$ and statement and appropriate angle reasons, eg statement $ACB = CBA (= 65^\circ)$ or two angles are equal (so it is isosceles) and the <u>exterior angle</u> of a triangle is <u>equal</u> to the sum of the <u>interior opposite angles</u> and <u>angles</u> on a straight <u>line</u> add up to 180 or <u>angles</u> in a <u>triangle</u> add up to 180	Underlined words need to be shown; reasons need to be linked to their method.
		(C1)	(dep on M1) for any one appropriate reason related to method shown)	
14 (a)	2	B1	cao	Accept hand drawn, ruler not required but intention clear
		M1	for straight line from (3, 5) to (5, 5) or for a straight line from (5, 5) to (630, 0) or line drawn from (3, 5) to (430, 0) or a line drawn from (x, 5) to (x + 130, 0) where $x \geq 3$	
		A1	cao	
(b)	Graph completed			

Paper 1MA1: 2F				
Question	Working	Answer	Mark	Notes
11 (a)		29	B1	answer in the range 29 to 30
			M1	for changing 6ft 3 inches to inches e.g. $6 \times 12 + 3 (= 75)$ or changing 1ft to 30 cm
			M1	for a method to convert to cm, e.g. $25 \rightarrow 63$ then $\times 3$, $6 \times 30 + \frac{1}{4} \times 30$
			A1	for answer in the range 186 to 195 or ft from correct use of graph
12		0.0733(03...)	M1 A1	for correct numerator (3.4496.....) or correct denominator (47.0596) or 0.073 for 0.0733(03.....)
13 (a)		Rotation	B2	for a fully correct rotation at $(-4,-1)$, $(-3,-1)$, $(-4,-4)$, $(-1,-2)$
			[B1	for the quadrilateral in correct orientation and size or rotated 90° anticlockwise about the origin]
			B1	for reflection
			B1	for y-axis (or $x=0$)
(b)		Reflection in the y-axis		[A combination of transformations scores 0 marks]

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
19	(a) 15	B1	cao	Accept readings from the graph as an indication at this stage
	(b) 4.6	B1	for an answer in the range 4.4 to 4.8	
	(c) 12	M1	for a method to calculate speed eg distance ÷ time (could be implied from figures used) eg $4 \div 20 (= 0.2)$ oe, $4 \div 0.33(\dots)$ oe or $4 \div 1/3$ oe	
		A1	cao	
20	100g butter 25g sugar 1 egg	P1	for process to find the amount needed of one ingredient for 25 scones	amount needed: 200g butter 875 flour 75 sugar 5 eggs Flour can be excluded, but no incorrect information about flour should be given.
		P1	for process to find the amount needed for at least three ingredients for 25 scones or for process to find the correct amount more for at least two of butter, sugar, eggs	
		P1	for complete process to find amount more for each of butter, sugar, eggs	
		C1	for correct amounts more shown for butter, sugar, eggs	
21	$a = \frac{p+9}{3}$	M1	for correct first step to rearrange eg $p + 9 = 3a - 9 + 9$ or $\frac{p}{3} = \frac{3a-9}{3}$ oe or answer ambiguously shown eg $a = p + 9 \div 3$ or given as $\frac{p+9}{3}$ oe	May be seen in different equivalent forms but must be carried out, not just intention seen.
		A1	oe	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
9 (a)	28	B1	cao	
9 (b)	4 : 9	M1 A1	for 8 : 18 or for any ratio equivalent to 4 : 9 or 9 : 4 or 2.25 : 1 for 4 : 9	Accept 4 : 9 in the form 1 : n, eg 1 : 2.25
10 (a)	6	B1	cao	
10 (b)	14 00	M1 M1 A1	for use of graph to find the maximum time paid for, eg £9.00 = 6 hours for intention to add times, eg 08 00 + “6” hrs for 14 00 or 2 pm	May be seen on graph 8, 9, 10, 11, 12, 1 is enough to show a clear intention to add For method marks condone use of incorrect time notation Correct time notation required
11	Shown	M1 M1 A1	for at least three of $40 \times 1 (= 40)$, $50 \times 2 (= 100)$, $60 \times 4 (= 240)$, $70 \times 5 (= 350)$, $80 \times 3 (= 240)$, $90 \times 1 (= 90)$ oe (dep M1) for a complete method to find comparable figures (allow up to 2 errors in their products), eg $40 \times 1 + 50 \times 2 + 60 \times 4 + 70 \times 5 + 80 \times 3 + 90 \times 1$ oe or for $1200 - 40 \times 1 - 50 \times 2 - 60 \times 4 - 70 \times 5 - 80 \times 3 - 90 \times 1$ oe for accurate comparable figures, eg 1060 or 140	Intention to multiply is enough for award of M1 May be seen as repeated addition Condone incorrect difference if 1060 is clearly seen

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
11 (a)	16	B1	cao	
	48	M1	for taking a suitable reading from the graph that could be used to convert, eg 25 km = 15.5 miles or 17 miles = 27.2 km	Allow a tolerance of one small square for the reading eg 10 km = 6 – 6.5 miles 20 km = 12.25 – 12.75 miles 25 km = 15.25 – 15.75 miles 30 km = 18.5 – 19 miles for miles to km allow 1 mile = 1.6 km 17 miles = 27 – 28 km
		M1	ft, for a complete method, eg “15.5” $\times$ 2 + 17 or (“27.2” + 50) $\div$ 1.6	
		A1	for an answer in the range 47 – 49.5	
12	6x + 7y	M1	for 6x or 7y or a linear expression in the form $ax + by$ where $a, b > 0$	T = 6x + 7y oe scores M1A0
		A1	for 6x + 7y oe	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
13 (a)(i)	30	B1	cao	
(ii)	10	B1	cao	
(b)	Drawn	M1	for a line from (1330 , 35) to (1500 , 35) or a line to the x axis from a point on $y = 35$ to 1600 on the x axis	
		A1	fully correct graph	
(c)	35	B1	for 35 or ft their graph	ft must be $35 \div$ time duration for their line
14	1.3	M1	for working with boxes or bags eg $600 \div 120 (= 5)$ or $1000 \div 270 (= 3.7(037..))$ $6 \div 120 (=0.05)$ or $10 \div 270 (= 0.037(037..))$	Cost $\div$ quantity For the M marks allow working in £ instead of p.
		M1	for working with bags and boxes where they are working to the same quantities of boxes and bags eg $600 \div 120 (= 5)$ and $1000 \div 270 (= 3.7(037..))$ $6 \div 120 (=0.05)$ and $10 \div 270 (= 0.037(037..))$	Other values are possible where they are using alternative quantities of boxes and bags, but these must be the same quantities of each.
		M1	for finding the difference eg “5” – “3.7(037..)” (= 1.29.. to 1.3) or “0.05” – “0.037(037..)” (= 0.0129.. to 0.013)	Must have consistent units for this mark.
		A1	for answer in the range 1.29 to 1.3	If an answer is given in the range in working and then rounded incorrectly award full marks.

