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

Sequences (A3)

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

25 questions · 71 marks · Mark schemes included

Past papers June 2017 - June 2025 · 2 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
A3a LINEAR SEQUENCES & NTH TERM		19 Qs · 55 marks	2
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2. Q13	GCSE Paper 3F June 2019	2	4
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A3b QUADRATIC, GEOMETRIC & OTHER SEQUENCES		6 Qs · 16 marks	22
20. Q5	GCSE Paper 1F November 2017	1	23
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QUESTIONS

25 questions · 71 marks · 2 sub-topics

SUB-TOPIC A3a

LINEAR SEQUENCES & NTH TERM

Sub-topic A3a · 19 questions · 55 marks · lowest tariff first



26 Here are the first four terms of an arithmetic sequence.

5 11 17 23

Write down an expression, in terms of n , for the n th term of the sequence.

(Total for Question 26 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS



12 Ali, Ben and Cathy share an amount of money in the ratio 6 : 9 : 10

What fraction of the money does Ben get?

(Total for Question 12 is 2 marks)

13 The first term of a sequence of numbers is 24

The term-to-term rule of this sequence is 'add 8'

Josie says,

"No number in this sequence is in the 5 times table."

(a) Give an example to show that Josie is wrong.

(1)

(b) Is 85 a number in this sequence?

Give a reason for your answer.

(1)

(Total for Question 13 is 2 marks)

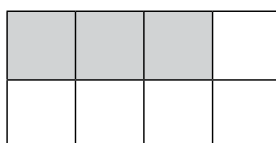


- 5 Change 4 kilometres into metres.

..... metres

(Total for Question 5 is 1 mark)

- 6 Here is a grid of squares.



Write down the ratio of the number of shaded squares to the number of unshaded squares.

.....

(Total for Question 6 is 1 mark)

- 7 $w = 4u + 3$

Find the value of w when $u = 8$

.....

(Total for Question 7 is 2 marks)

- 8 Here are the first five terms of a sequence.

1 3 6 10 15

Write down the next two terms of the sequence.

..... , ...

(Total for Question 8 is 2 marks)

20 The first five terms of an arithmetic sequence are

1 4 7 10 13

Write down an expression, in terms of n , for the n th term of this sequence.

(Total for Question 20 is 2 marks)

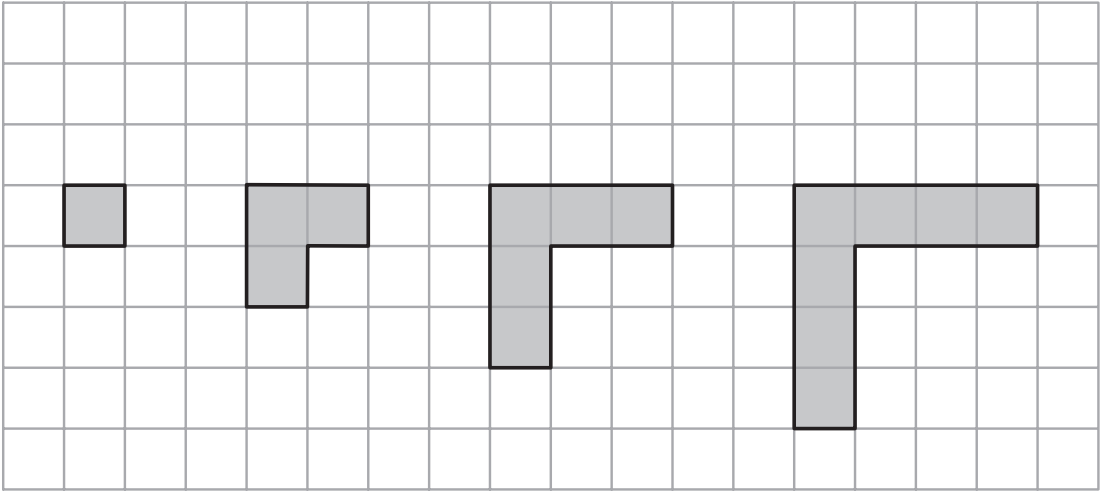
21 Show that

$$2\frac{1}{3} \times 3\frac{3}{4} = 8\frac{3}{4}$$

(Total for Question 21 is 3 marks)



9 Here is a sequence of patterns made from grey square tiles.



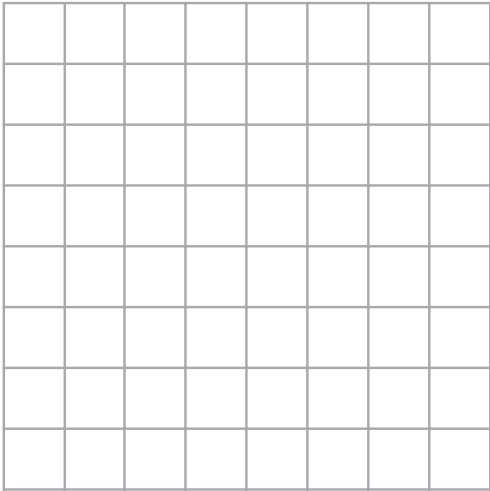
Pattern
number 1

Pattern
number 2

Pattern
number 3

Pattern
number 4

(a) On the grid below, draw Pattern number 5



(1)

(b) Complete the table.

Pattern number	1	2	3	4	5	6
Number of squares	1	3	5	7		

(1)

(Total for Question 9 is 2 marks)



8 Here are the first five terms of a number sequence.

3 8 13 18 23

(a) Write down the next two terms of this sequence.

.....
(1)

Jim says that 50 is a term in this sequence.

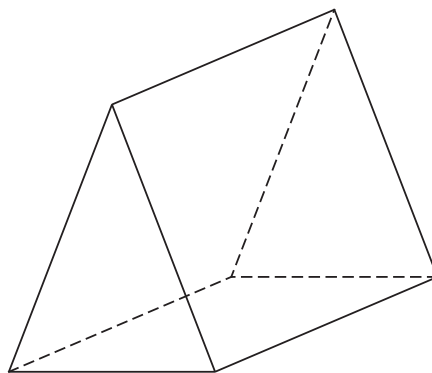
Jim is wrong.

(b) Explain why.

.....
(1)

(Total for Question 8 is 2 marks)

9 The diagram shows a solid triangular prism.



(a) Write down the number of faces of the prism.

.....
(1)

(b) Write down the number of edges of the prism.

.....
(1)

(Total for Question 9 is 2 marks)

10 Here are the first three terms of a sequence.

20 16 13

(i) Write down two numbers that could be the 4th and 5th terms of this sequence.

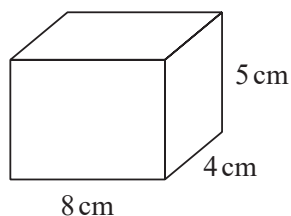
....., ...
(1)

(ii) Write down the rule you used to get your numbers.

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

(Total for Question 10 is 2 marks)

11 Here is a cuboid.



Work out the volume of the cuboid.

..... cm³

(Total for Question 11 is 2 marks)

19 Here are the first five terms of an arithmetic sequence.

-5 3 11 19 27

Find an expression, in terms of n , for the n th term of this sequence.

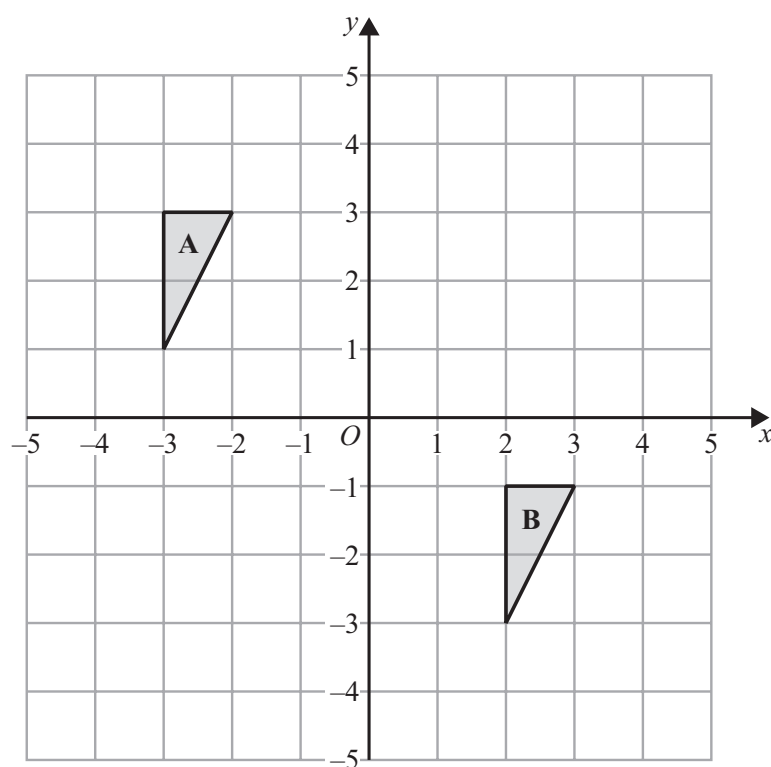
(Total for Question 19 is 2 marks)

20 Work out $8.46 \div 0.15$

(Total for Question 20 is 3 marks)



19



Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

.....

.....

.....

(Total for Question 19 is 2 marks)

20 Here are the first four terms of an arithmetic sequence.

1 5 9 13

Find an expression, in terms of n , for the n th term of this sequence.

.....

(Total for Question 20 is 2 marks)



25 Here are the first six terms of an arithmetic sequence.

3 8 13 18 23 28

(a) Find an expression, in terms of n , for the n th term of this sequence.

.....
(2)

The n th term of a different sequence is $3n^2$
Nathan says that the 4th term of this sequence is 144

(b) Is Nathan right?
Show how you get your answer.

(1)

(Total for Question 25 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

- 1 Write $\frac{9}{10}$ as a decimal.

.....

(Total for Question 1 is 1 mark)

- 2 Write 0.3 as a percentage.

.....%

(Total for Question 2 is 1 mark)

- 3 Write the number 2538 correct to the nearest hundred.

.....

(Total for Question 3 is 1 mark)

- 4 Here are the first 4 terms of a sequence.

2 9 16 23

- (a) (i) Write down the next term in the sequence.

.....
(1)

- (ii) Explain how you got your answer.

.....
(1)

- (b) Work out the 10th term of the sequence.

.....
(1)

(Total for Question 4 is 3 marks)



12 Here are the first five terms of a number sequence.

45 40 35 30 25

(a) (i) Write down the next two terms of this sequence.

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

A term of this sequence is -5

(ii) Which term?

.....
(1)

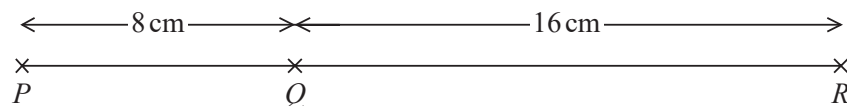
The n th term of a different sequence is given by the expression $4n + 3$

(b) Find the 9th term of this sequence.

.....
(1)

(Total for Question 12 is 3 marks)

- 8 The diagram shows three motorway service stations P , Q and R on a map.



The map has a scale of $1 \text{ cm} = 4 \text{ km}$.

Work out the real distance from P to R .

..... km

(Total for Question 8 is 3 marks)

- 9 Here are the first five terms of a sequence.

3 8 13 18 23

- (a) Write down the next term of this sequence.

.....
(1)

- (b) Write down the ratio of the second term to the fourth term.
Give your ratio in its simplest form.

.....
(2)

(Total for Question 9 is 3 marks)



12 The n th term of a sequence is $4n - 1$

(a) Work out the 3rd term of the sequence.

.....
(1)

Here are the first four terms of a different sequence.

9 15 21 27

(b) Is 63 a number in this sequence?

You must give a reason for your answer.

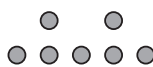
.....
.....
.....
(2)

(Total for Question 12 is 3 marks)

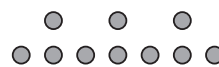
18 Here is a sequence of patterns made with counters.



pattern number 1



pattern number 2



pattern number 3

- (a) Find an expression, in terms of n , for the number of counters in pattern number n .

.....
(2)

Bayo has 90 counters.

- (b) Can Bayo make a pattern in this sequence using all 90 of his counters?
You must show how you get your answer.

(2)

(Total for Question 18 is 4 marks)

- 9 (a) The n th term of a sequence is $3n + 4$

Explain why 21 is not a term of this sequence.

.....

.....

(2)

- (b) Here are the first three terms of a different sequence.

1 2 4

Write down two numbers that could be the 4th term and the 5th term of this sequence.
Give the rule you have used to get your numbers.

.....

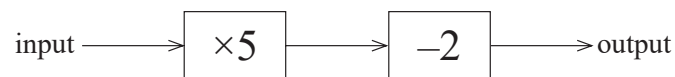
.....

.....

(2)

(Total for Question 9 is 4 marks)

- 10 Here is a number machine.



- (a) Work out the **output** when the input is 8

.....

(1)

- (b) Work out the **input** when the output is 28

.....

(2)

(Total for Question 10 is 3 marks)

20 Here are the first five terms of an arithmetic sequence.

7 13 19 25 31

(a) Find an expression, in terms of n , for the n th term of this sequence.

.....
(2)

The n th term of a different sequence is $8 - 6n$

(b) Is -58 a term of this sequence?

You must show how you get your answer.

(2)

(Total for Question 20 is 4 marks)



- 7 Miklos is swimming lengths of a swimming pool.
Each length of the pool is 25 m.

Miklos has swum 178 lengths of the pool.
He wants to swim a total distance of 8050 m.

Calculate how many more lengths Miklos needs to swim.

(Total for Question 7 is 3 marks)

- 8 Here are the first four terms of a number sequence.

97 91 85 79

- (a) Explain how to work out the next number of the sequence.

(1)

- (b) Work out the difference between the 5th term and the 7th term of the sequence.

(2)

- (c) Explain why 52 is **not** a number in this sequence.

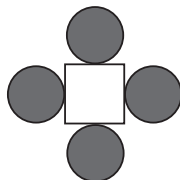
(1)

(Total for Question 8 is 4 marks)

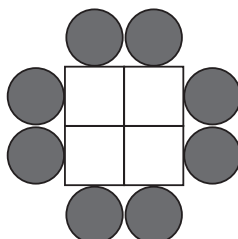


- 11 A sequence of patterns is made from circular tiles  and square tiles 

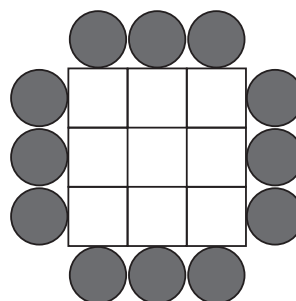
Here are the first three patterns in the sequence.



pattern number 1



pattern number 2



pattern number 3

- (a) How many square tiles are needed to make pattern number 6?

.....
(2)

- (b) How many circular tiles are needed to make pattern number 20?

.....
(2)

Derek says,

“When the pattern number is odd, an odd number of square tiles is needed to make the pattern.”

- (c) Is Derek right?
You must give reasons for your answer.

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

(Total for Question 11 is 6 marks)

SUB-TOPIC A3b

QUADRATIC, GEOMETRIC & OTHER SEQUENCES

Sub-topic A3b · 6 questions · 16 marks · lowest tariff first



- 5 Here are the first four terms of a number sequence.

2 5 11 23

The rule to continue this sequence is

multiply the previous term by 2 and then add 1

Work out the 5th term of this sequence.

(Total for Question 5 is 1 mark)

- 6 Here are five straight rods.

$\overline{\leftarrow a - 1 \rightarrow}$ $\overline{\leftarrow a \rightarrow}$ $\overline{\leftarrow a \rightarrow}$ $\overline{\leftarrow a \rightarrow}$ $\overline{\leftarrow a + 4 \rightarrow}$

All measurements are in centimetres.

The total length of the five rods is L cm.

Find a formula for L in terms of a .

Write your formula as simply as possible.

(Total for Question 6 is 3 marks)

28 Here are the first five terms of a Fibonacci sequence.

3 3 6 9 15

(a) Write down the next two terms of the sequence.

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

The first three terms of a different Fibonacci sequence are

a a $2a$

(b) Find the 6th term of this sequence.

.....
(2)

(Total for Question 28 is 3 marks)

29 $\mathbf{a} = \begin{pmatrix} 4 \\ 5 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$

Work out $\mathbf{a} - 2\mathbf{b}$ as a column vector.

$\begin{pmatrix} \\ \text{---} \\ \end{pmatrix}$

(Total for Question 29 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS



26 The n th term of a sequence is $2n^2 - 1$

The n th term of a different sequence is $40 - n^2$

Show that there is only one number that is in both of these sequences.

(Total for Question 26 is 3 marks)

27 Work out $(3.42 \times 10^{-7}) \div (7.5 \times 10^{-6})$
Give your answer in standard form.

(Total for Question 27 is 2 marks)



13 A number sequence starts 1 2 4

Emma says that the next term is 7

(a) Explain why Emma may be correct.

(1)

Here are the first four terms of the sequence of triangle numbers.

1 3 6 10

(b) Find the 8th term of this sequence.

(2)

(Total for Question 13 is 3 marks)



25 The first four terms of a Fibonacci sequence are

$$a \quad 2a \quad 3a \quad 5a$$

The sum of the first five terms of this sequence is 228

Work out the value of a .

(Total for Question 25 is 3 marks)



29 The first three terms of a Fibonacci sequence are

$$a \quad 3a \quad 4a$$

The 5th term of this sequence is 286

Work out the value of a .

$$a = \dots\dots\dots$$

(Total for Question 29 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS



MARK SCHEMES

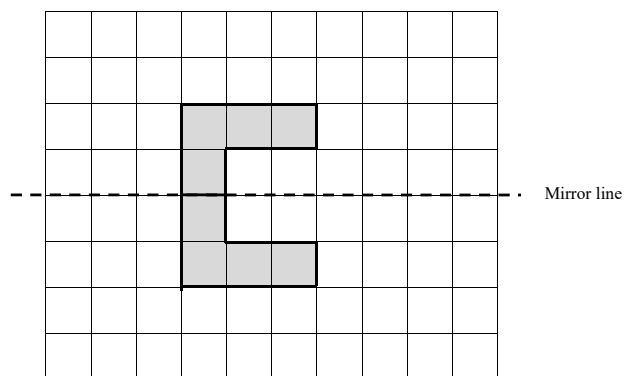
official mark schemes, in the same order as the questions



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	17.3	P1	for full process to find either angle eg $(180 - 90) \div (2+3) \times 2$ or for 36 or 54 seen as an angle	May be seen on diagram Condone correct values if incorrectly placed.
		P1	for a correct equation using trigonometry eg $\cos [A] = 14 \div AB$	This must be shown as an equation with all four elements (eg $\cos$, $[A]$, 14, AB) present. $[A]$ could be 36 or any angle clearly and unambiguously identified as A . This also applies to $[B]$ with Sine.
		P1	(dep previous P mark) for rearranging their trigonometry equation to make AB the subject eg $(AB =) "14 \div \cos 36"$	
		A1	for an answer in the range 17.3 to 17.4	If an answer is shown in the range in working and then incorrectly rounded award full marks.
26	$6n - 1$	M1	for $6n + k$, where $k \neq -1$ or missing	Accept a different variable for M1 only
		A1	oe	Note $n = 6n - 1$ gets M1 only



10



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
12	$\frac{9}{25}$	M1 A1	for $\frac{n}{6+9+10}$ where n is an integer < 25 for $\frac{9}{25}$	Or equivalent fraction
13 (a)	example	C1	example given eg 40, 80, etc.	No can be implied from their statement
(b)	No with reason	C1	for No with reason Acceptable examples 80 and 88 are both in the sequence 80 is in the sequence and 85 is 5 more 24, 32, ... 80, 88, ... 85 is not in the 8 times table 85 is an odd number $8n+16=85$ so n is not a whole number. Not acceptable examples adding 8 each time will not lead to 85 (insufficient) it goes past 85 Yes	
14	2.4774(011...)	M1 A1	for 8.77 or 3.54 or 2.477 or 2.47 or 2.48 or $\frac{877}{354}$ for 2.4774(011...)	If the answer has been rounded to less than 4 dp but the figure is shown in working to 4 dp or more, award full marks. Ignore any incorrect digits after the 4 th decimal place.



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	Two correct factors	B1	for 2 correct factors from 1, 2, 3, 4, 6, 12 and no incorrect factors	Accept one correct product
2	10	B1	cao	
3	$\frac{7}{10}$	B1	for $\frac{7}{10}$ or for any other equivalent fraction	Eg $\frac{70}{100}$
4	18	B1	cao	
5	4000	B1	cao	
6	3 : 5	B1	for 3 : 5 or for any other equivalent ratio	
7	35	M1 A1	for $4 \times 8 (=32)$ cao	Award this mark if used ambiguously eg $4 \times 8 + 3 = 4 \times 11$ as long as 4×8 is stated
8	21, 28	B2 (B1	both correct one correct in the correct position or for $15 + 6 (= a)$ or $a + 7 (= b)$ where $a \neq 21$ and $b \neq 28$)	May be written alongside the given sequence but if contradiction accept the answer line. If both correct, accept in either order. May be seen as "+6" next to the sequence

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: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	(a) Completed bar chart	B2 (B1)	for a fully correct bar chart for one bar correct eg May plotted at 35 or June plotted at 20 OR May plotted at 20 and June plotted at 35)	Condone bars of unequal width Condone no gaps or inconsistent gaps
	(b) Explanation	C1	Acceptable examples Half a square is worth 2.5 (not 0.5) It goes to 17.5 Halfway between 15 and 20 is not 15.5 It is between 17 and 18 It could/would be 17 or 18 It goes up in 5s (not 1s) Not acceptable examples The bar is in the middle It could/would be 16 (or 19 or 15.6) You can't have half a cm of rain The answer would be a whole number	
9	(a) Shape drawn	B1	cao	Ignore any subsequent values
	(b) 9 and 11	B1	cao	
10	27	M1 A1	for $-15 + 42 (=27)$ oe cao	SC: B1 for answer of 26 if M0 scored



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	(a) 28 33	B1	cao	One correct, one incorrect statement gets C1 as long as they are not contradictory.
	(b) Explanation	C1	for explanation Acceptable examples all terms end in 3 or 8 there are no terms that end in 0 50 does not end in 3 or 8 48 and 53 are both in the sequence (could be shown) 48 is in the sequence and 50 is 2 more $5n-2=50$ so n is not a whole number. if it started at 0 then it would but it starts at 3 so it never will or shows sequence continuing up to and beyond 50 Not acceptable examples adding 5 each time will not lead to 50 (insufficient) it goes past 50 the closest number to 50 is 48	
9	(a) 5	B1	cao	
	(b) 9	B1	cao	
10	(a) cross at 0	B1	cao	To fit “5” the “5” needs to be clearly stated as being the number of even numbers; otherwise accept 5 only; could be indicated alongside the given numbers. Could be written as a decimal (0.62, 0.625 or 0.63) or equivalent percentages to these
	(b) cross at $\frac{1}{2}$	B1	cao	
	(c) $\frac{5}{8}$	M1	“5” for $\frac{5}{a}$ where $a > 5$ or $\frac{b}{8}$ where $b < 8$ or for identifying all the even numbers, 2, 6 and 8 or for writing the correct probability using the wrong notation eg 5 : 8	
		A1	for $\frac{5}{8}$ oe	



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: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
18	$T = 5b + 28c$	M1 M1 A1	for $5b$ or $28c$ or $T =$ a linear expression in b and/or c for $5b + 28c$ or partially correct formula, eg $T = 5b (+ kc)$ oe or $T = 28c (+ kb)$ oe for $T = 5b + 28c$ oe	Allow $5 \times b$ and $28 \times c$ throughout
19	$8n - 13$	B2 (B1)	for $8n - 13$ oe for $8n + k$ where $k \neq -13$ or is absent unambiguously shown)	Accept a different variable eg $8x - 13$ $n = 8n - 13$ or $8n^{\text{th}} - 13$ gets B1 only
20	56.4	M1 A1 A1	for a start to a method, eg $846 \div 15$ or $8.46 \div 0.15$ or $8.46 \div 3 \times 20$ or $282 \div 5$ that leads to 5 as the first digit. or for a complete method with no more than one arithmetic error. for digits 564 identified (ft) dep on M1 for correct placement of the decimal point into their final answer	A start to a repeated subtraction method or a build-up method is acceptable if a correct first digit of 5 is found An answer of $56\frac{2}{5}$ gets 3 marks



Paper: 1MA1/1F				
Question	Answer	Mark	Mark scheme	Additional guidance
17	3.5	M1	for correct expansion of brackets, ie $8x - 10$ or dividing throughout by 2 as a first step to solve equation, eg $4x - 5 = 9$	For M marks step must be carried out not just intention shown. For example, if you see $\begin{array}{r} 2(4x - 5) = 18 \\ \div 2 \qquad \qquad \div 2 \end{array}$ Award M1 for: $4x - 5 = k$ with $k \neq 18, 36$
		M1	for isolating terms in x, eg $8x = 18 + 10$ or $4x = 9 + 5$	ft their equation of the form $ax \pm b = c$ For example, if you see $\begin{array}{r} 8x - 10 = 18 \\ +10 \qquad \qquad +10 \end{array}$ Award M1 for: $8x = k$ with $k \neq 8, 18$
		A1	for 3.5 or $3\frac{1}{2}$ oe or $\frac{7}{2}$ oe	
18	1	B1	cao	
19	Translation $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$	B1	for translation	
		B1	for $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$ NB: award no marks if more than one transformation is given	Do not accept 5 across, 4 down or 5 right, 4 down. Condone omission of brackets around vector. Do not accept vector given as coordinate.
20	$4n - 3$	B2	for $4n - 3$ oe	Accept a different variable eg $4x - 3$ Accept $u_n = 4n - 3$, $T = 4n - 3$ etc
		(B1	for $4n + k$ where $k \neq -3$ or is absent unambiguously shown)	$n = 4n - 3$ or $4n^{\text{th}} - 3$ gets B1 only

Paper 1MA1: 2F				
Question	Working	Answer	Mark	Notes
25 (a)		$5n - 2$	B2	for $5n - 2$ oe
			[B1	for $5n + k$, k may be 0]
(b)		No (supported)	C1	for No with evidence, e.g. $3 \times 4^2 = 48$, $\sqrt{48}$ is not an integer, he has multiplied by 3 first but should have squared first



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	0.9	B1	cao	Accept with trailing 0s eg 0.90
2	30	B1	cao	Accept 30.0
3	2500	B1	cao	
4	(a)(i) 30 (ii) Explanation (b) 65	B1 C1 B1	cao for explanation, eg increase by 7, add 7, states $7n - 5$ cao	
5	(a) 974 (b) 16,28 or 18,26	B1 B1	cao for fully correct pair of numbers	
6	1, 2, 3, 5, 6, 10, 15, 30	B2 (B1	cao for at least 3 correct factors with no more than one incorrect answer)	Numbers may be shown in any order eg paired; Accept numbers repeated
7	24	M1 A1	for a complete method eg $6 \times 2 \times 2$ or sight of 6, 2, 2 ready for calculation, or with the wrong operation cao	Could be seen as two separate calculations SC:B1 for a answer of 1.5 oe
8	(a) 2.28 (b) 2.5604	B1 B2 (B1	cao cao for 6.6564 seen, or for 2.56 or for digits 25604)	If the correct answer is shown and then rounded, award full marks.



Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)(i)	20, 15	B1	cao	Working may be seen near the sequence
(ii)	11	B1	cao	Working may be seen near the sequence
(b)	39	B1	cao	
13	34	M1	for start to method, eg $10 - 4 (= 6)$ or $7 - 5 (= 2)$ or $10 + 7 + 4 + 5 (= 26)$ or $(10 + 7) \times 2$	6, 2 may be seen on diagram
		A1	cao	
14 (a)	$5x + y$	M1	for method to collect terms, eg $5x$ or y	May be seen in working. Accept if no ambiguity. Accept 1y.
		A1	cao	
(b)	3	M1	for subtracting 7 from both sides or dividing each term by 5 as a first step, eg $5p = 15$ or $5p = 22 - 7$ or $\frac{5p}{5} + \frac{7}{5} = \frac{22}{5}$	Must be carried out, not just intention. Division by 5 must be all terms.
		A1	cao	



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	16	M1	Yes... for converting, eg $1.2 \times 100 (= 120)$ or $136 \div 100 (= 1.36)$ or for an answer of 0.16 or for [Elena's height] – 1.2 or for $136 - [\text{George's height}]$	[Elena's height] = 13 600 or 1360 or 13.6 or 1.36 [George's height] = 120 or 12 or 0.12 or 0.012
		A1	cao	
12 (a)	11	B1	cao	33, 39, 45, 51, 57, 63
(b)	Yes (supported)	M1	for method to show that 63 is in the sequence, eg starts to list terms of the sequence, with at least 3 correct or $6n + 3 = 63$ or $(63 - 3) \div 6 (= 10)$ or $6 \times 10 + 3$ or $(63 - 27) \div 6$ or $27 + 6 + 6 + 6 + 6 + 6 + 6$	
		A1	eg Yes and 33, 39, 45, 51, 57, 63 Yes and $n = 10$ Yes and $(63 - 3) \div 6$ is a whole number Yes and $6 \times 10 + 3 = 63$ Yes and $63 - 27$ is divisible by 6, and the sequence goes up in 6's Yes and $27 + 6 + 6 + 6 + 6 + 6 + 6 = 63$ OR Like all the other terms in the sequence, it is in the 3 times table but not the 6 times table It's the 10th term / 63 is the 10 th term	'Yes' can be implied by an equivalent statement eg '63 is in the sequence' Ignore additional incorrect statements but if the statement contradicts award A0 eg '33, 39, 45, 51, 57, 63, and yes and it's the 11 th term' would be M1A0

Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
18 (a)		$3n + 1$	M1	for a method to deduce the n th term, eg. $3n + k$, where k is an integer or k is omitted or for $n = 3n + 1$
			A1	for $3n + 1$ oe (accept n replaced by another letter)
(b)		No (supported)	C1	for using (their expression in (a)) = 90 or shows that 88 or 91 is in the sequence
			C1	for an answer of "No" and a convincing argument eg. pattern number 30 has 91 counters or $(90 - 1) \div 3 (= 29.66\dots)$ or shows that the next term after 88 is 91 Note: no fit from (a)
19 (a)		$160 < h \leq 170$	B1	correct class interval
(b)		Line segments joining the points (135, 4), (145, 11), (155, 24), (165, 22) and (175, 19)	C2 [C1]	for fully correct frequency polygon for points plotted correctly at midpoints of intervals OR joining points with line segments at the correct heights and consistent within the intervals (including end values) OR correct frequency polygon with one point incorrect OR correct frequency polygon with first and last point joined] NB: ignore any histogram drawn and any part of frequency polygon outside range of first and last points plotted

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
9 (a)	Explanation	C2	full explanation eg explains that both 19 and 22 are terms in the sequence or solves $3n + 4 = 21$ to find $n = 17/3$ oe Acceptable examples 19 is in the sequence and $19 + 3$ is more than 21 The 5th term is 19 and the 6th term is 22 7, 10, 13, 16, 19, 22 17 is not in the 3 times table Because 21 is in the 3 times table and the sequence is plus 4 (C1 for substituting to find a term in the sequence or forming an equation eg $3n + 4 = 21$ or for a partial explanation or an explanation with some ambiguity) Acceptable examples The closest number is 22 $3 \times 6 = 18$, $18 + 4$ is higher than 21 19 is in the sequence so 21 can't be in the sequence. Starting at 7 and adding 3 each time won't lead to 21 It's the 3 times table plus 4 21 is in the 3 times table Not acceptable examples Adding 4 each time won't lead to 21 It doesn't end up at 21, it goes past it	7, 10, 13, 16, 19, 22, ...



Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
9 (b)	terms given	B1	states two terms eg 7,11 or 8,16 or 5, 7	May be indicated on the sequence with no contradictory statement made
	explanation	C1	explanation eg add one more each time, doubling Acceptable examples Add 3 and add 4 The difference goes up by one each time It doubles +1, +2, +1, +2 or indicates +1, +2 repeats itself Not acceptable examples It goes up by 1 each time It doubles so $2n$ +1, +2, +3, +4 so $2n + 1$	
10 (a)	38	B1	cao	+2 ÷ 5 could be seen in a flow diagram
	6	M1	starts process to find input using inverse operations eg $28 + 2$ or sight of $+2 \div 5$	
		A1	or by forming an equation eg $x \times 5 - 2 = 28$ cao	
11	4	M1	for $\frac{30}{100} \times 80 (=24)$ oe or for 104	Numbers in subtraction may be reversed
		M1	(dep) for $28 - "24"$ or $108 - 104$	
		A1	for 4 or -4	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
19	Elevation	B2 (B1)	fully correct side elevation 5 high and 3 wide for a rectangle 5 high and 3 wide or correct side elevation in the wrong orientation)	
20 (a)	$6n + 1$	B2	oe	
(b)	Shown with supportive working	(B1) M1 A1	for $6n + c$ where c is an integer $\neq 1$ or is missing) for $8 - 6n = -58$ or $8 - 6 \times 11 (= -58)$ or starts to list terms of the sequence, with at least 3 correct or any other valid method. shown with working or an explanation, eg Yes and 11 or 2, -4, -10, -16, ..., -52, -58	2, -4, -10, -16, -22, -28, -34, -40, -46, -52 May stop at -58 or ring if sequence continues
21	186.15	P1 P1 P1 P1 A1	for correctly finding the area of at least three sections, eg 3 of $11 \times 7 (= 77)$, or $9 \times 7 (= 63)$, or $\frac{1}{2} \times 11 \times 9 (= 49.5)$, or $\frac{1}{4} \times \pi \times 7^2 (= 38.4845\dots)$ for a method to find the number of bags required for one area or a combination of areas eg "77" $\div 14 (= 5.5)$ or "227.9845.." $\div 14 (= 16.2846\dots)$ for method to work out the total area for all four sections eg "77" + "63" + "49.5" + "38.4845.." (= 227.9845...) or adding the exact number of bags per section for all four sections eg "5.5" + "4.5" + "3.53.." + "2.74.." (= 16.28...) for method to find the cost, eg integer number of bags $\times 10.95$ cao	Note a trapezium for the rectangle and triangle should be classed as two areas. Accept figures rounded or truncated to 1 dp or better throughout. This mark is dependent upon correct processes seen for all four sections. integer number of bags must come from area $\div 14$ rounded up

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
7	144	P1	for process to begin to work with length, eg $8050 \div 25 (= 322)$ or $178 \times 25 (= 4450)$	3600 implies the first P1 mark
		P1	for full process to find number of lengths remaining, eg “322” – 178 or $(8050 - “4450”) \div 25$ or $3600 \div 25$	
		A1	cao	
8 (a)	Explanation	C1	for explanation, eg subtract 6, decrease by 6, going down by 6	At least one term must be correct and intention to subtract shown Accept –12
(b)	12	M1	for $73 - 61$ or 6×2	
		A1	cao	
(c)	Explanation	C1	for explanation relating to odd and/or even numbers Acceptable 52 is even the sequence is odd numbers it goes to 55 (and you cannot reach 52) it goes to 49 (which has gone past 52) nth term is $103 - 6n = 52$ which has no integer solutions 52 is between the 8 th and 9 th terms Not acceptable subtracting 6 each time will not lead to 52 it goes past 52	

Paper: 1MA1/1F				
Question	Working	Answer	Mark	Notes
11 (a)		36	M1 A1	demonstrates the start of a method that could lead to the answer, eg recognition of square numbers, or use of differences, or diagrams cao
(b)		80	M1 A1	demonstrates the start of a method that could lead to the answer, eg repeated addition of 4, or 20×4 cao
(c)			C2 (C1)	conclusion with supportive evidence, eg $\text{odd} \times \text{odd} = \text{odd}$, or all odd numbers squared will be odd. (e.g. starts to work with (generate) square numbers for odd patterns or $(2n + 1)^2$ eg $1 \times 1 = 1$, or generates sequence for squares using differences)
12		$\frac{7}{17}$	M1 A1	for $\frac{a}{17}$ where $a \neq 7$ but < 17 or $\frac{7}{b}$ where $b \neq 17$ but > 7 oe
13 (a)		1.5 to 2	B1	in the range 1.5 to 2
(b)		7.5 to 12	M1 A1	for scale factor in the range 5 to 6 (ft) or for answer in the range 7.5 to 12



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



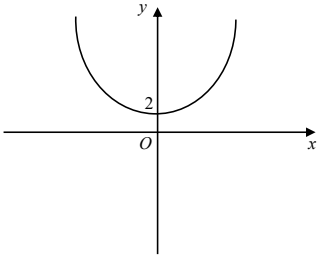
Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
27	(a) 5.62×10^{-3}	B1	cao	
	(b) 1452	B1	cao	
28	(a) 24, 39	B1	cao	SC: B1 for 3, 5, 8 seen if M0 scored
	(b) $8a$	M1 A1	for a complete method to find the next 2 terms, eg. $a + 2a (= 3a)$ and $2a + "3a" (= 5a)$ $8a$ oe	
29	$\begin{pmatrix} -2 \\ 1 \end{pmatrix}$	M1 A1	for $4 - 2 \times 3 (= -2)$ or $5 - 2 \times 2 (= 1)$ seen as a calculation OR for $\begin{pmatrix} 4 \\ 5 \end{pmatrix} - \begin{pmatrix} 2 \times 3 \\ 2 \times 2 \end{pmatrix}$ OR for $\begin{pmatrix} -2 \\ b \end{pmatrix}$ where $b \neq 1$ or $\begin{pmatrix} a \\ 1 \end{pmatrix}$ where $a \neq -2$ cao	May be in a column vector

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
12	Yes, supported by correct working	P1	for 36 : 48 oe OR $\frac{36}{84}$ oe or $\frac{48}{84}$ oe	Relating to drama group 1
		P1	for $\frac{4}{7}$ or 3 : 4 oe (for group 2) OR $(\frac{36}{84} = \frac{3}{7})$ or $(\frac{48}{84} = \frac{4}{7})$ or $84 \times 3 \div 7 (= 36 \text{ boys})$ or $84 \times 4 \div 7 (= 48 \text{ girls})$ or $N \times 3 \div 7$ and $N \times 4 \div 7$	Relating to drama group 2 N can be any number (other than 84) of students in the 2 nd group
		A1	for Yes with both ratios 3 : 4 oe or for a correct pair of fractions and stating they are equivalent.	Both equivalent forms of the ratios (fractions) must be the same "Yes" may be implied from working
13 (a)	Explanation	C1	for explanation Acceptable examples the sequence is going +1, +2 so the next term is +3 $1 + 1 = 2$, $2 + 2 = 4$, $4 + 3 = 7$ add the current term position to the term to get the next term add the two previous terms and add 1 Not acceptable examples you add 1 each time the number goes up by 3 7 is wrong it should be 8 because you double each time	The pattern may be just seen on the sequence given
(b)	36	M1 A1	for finding the next term of $10 + 5 (=15)$ or for $\frac{1}{2} \times 8 \times (8 + 1)$ oe 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 If the answer is given within the range but then rounded incorrectly award full marks.
		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	Lines do not need to extend to the ends of the axes if the intention is clear
		A1	fully correct shape	



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