Mark Scheme (Results)

Summer 2018

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Non-Calculator) Paper 1F

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General marking guidance

These notes offer general guidance, but the specific notes for examiners appertaining to individual questions take precedence.

1 All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first.

Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification/indicative content will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the response should be sent to review.

2 All the marks on the mark scheme are designed to be awarded; mark schemes should be applied positively. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no answer) indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

Questions where working is not required: In general, the correct answer should be given full marks.
Questions that specifically require working: In general, candidates who do not show working on this type of question will get no marks – full details will be given in the mark scheme for each individual question.

3 **Crossed out work**
This should be marked **unless** the candidate has replaced it with an alternative response.

4 **Choice of method**
If there is a choice of methods shown, mark the method that leads to the answer given on the answer line.

If no answer appears on the answer line, mark both methods **then award the lower number of marks.**

5 **Incorrect method**
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.

6 **Follow through marks**
Follow through marks which involve a single stage calculation can be awarded without working as you can check the answer, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

7   Ignoring subsequent work
It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question or its context. (eg. an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect (eg. incorrect algebraic simplification).

8   Probability
Probability answers must be given as a fraction, percentage or decimal. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

9   Linear equations
Unless indicated otherwise in the mark scheme, full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously identified in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded (embedded answers).

10   Range of answers
Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and all numbers within the range.

11   Number in brackets after a calculation
Where there is a number in brackets after a calculation E.g. 2 × 6 (=12) then the mark can be awarded **either** for the correct method, implied by the calculation **or** for the correct answer to the calculation.

12   Use of inverted commas
Some numbers in the mark scheme will appear inside inverted commas E.g. "12" × 50 ; the number in inverted commas cannot be any number – it must come from a correct method or process but the candidate may make an arithmetic error in their working.

13   Word in square brackets
Where a word is used in square brackets E.g. [area] × 1.5 : the value used for [area] does **not** have to come from a correct method or process but is the value that the candidate believes is the area. If there are any constraints on the value that can be used, details will be given in the mark scheme.

14   Misread
If a candidate misreads a number from the question. Eg. uses 252 instead of 255; method or process marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

Guidance on the use of abbreviations within this mark scheme

M   method mark awarded for a correct method or partial method

P   process mark awarded for a correct process as part of a problem solving question

A   accuracy mark (awarded after a correct method or process; if no method or process is seen then full marks for the question are implied but see individual mark schemes for more details)

C   communication mark

B   unconditional accuracy mark (no method needed)

oe   or equivalent

cao   correct answer only

ft   follow through (when appropriate as per mark scheme)

sc   special case

dep   dependent (on a previous mark)

indep independent

awrt answer which rounds to

isw   ignore subsequent working

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
1	6000	B1	cao	Accept 6 thousand or six thousand
2 (a)	−6,−5,0,6,12	B1	for −6,−5,0,6,12 accept 12, 6, 0, −5,−6	
(b)	0.078,0.708, 0.78,0.87	B1	for 0.078, 0.708, 0.78, 0.87 accept 0.87, 0.78, 0.708, 0.078	Accept any additional '0's at the end of a decimal, eg 0.780 or 0.870
3	$\dfrac{20}{100}$	B1	$\frac{20}{100}$ oe, eg $\frac{2}{10}$ or $\frac{1}{5}$	Ignore any incorrect simplification of $\frac{20}{100}$ oe and award the mark if $\frac{20}{100}$ oe is seen
4	$\dfrac{3}{9}$	B1	for $\frac{3}{9}$ accept $\frac{1}{3}$	
5	14	B1	cao	
6 (a)	12*t*	B1	12*t*	Accept *t*12 but **not** 12 × *t* or *t* × 12
(b)	7*a*	B1	7*a*	Accept *a*7 or 7 × *a* or *a* × 7 Partial simplification of 5*a* + 2*a* or 8*a* − *a* does NOT get the mark

Question		Answer	Mark	Mark scheme	Additional guidance
7	(a)	D	B1	cao	
	(b)	B	B1	cao	
	(c)	Shown	M1	for number of green counters, eg $12 - (3+1+2) = 6$ **OR** for $\frac{3}{12}$ oe **or** $\frac{1}{12}$ oe **or** $\frac{2}{12}$ oe linked to the appropriate colour	This is awarded for a correct first step
			M1	for $1 - ("\frac{3}{12}" + "\frac{1}{12}") (= \frac{8}{12})$ or $"\frac{2}{12}" + "\frac{6}{12}" (= \frac{8}{12})$ **OR** for method to find $\frac{2}{3}$ of 12, eg. $12 \div 3 \times 2 (= 8)$	This is awarded for a fully correct method from which the correct answer of $\frac{2}{3}$ can be found Sight of $\frac{8}{12}$ gets M2
			C1	for correct conclusion supported by accurate figures, eg $\frac{8}{12} = \frac{2}{3}$ **or** $\frac{2}{3}$ of 12 = 8 **and** number of yellow + green = 2 + 6 = 8	
8		36	M1	for method to find cost of 1 kg, eg $54 \div 3 (= 18)$ or $54 \div 3 \times 2$ oe	
			A1	cao	
9	(a)	Radius	B1	cao	Accept spelling mistakes
	(b)	Tangent	B1	cao	Accept spelling mistakes

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
10	535	P1	for a start to the process eg 1280+640+220 (=2140) **or** 1280÷4 (=320) **or** 640÷4 (=160) **or** 220÷4 (=55)	
		P1	for a full process to find cost per adult eg "2140" ÷ 4 **or** "320" + "160" + "55"	Can have arithmetical error as long as the complete processes, in the correct order, are present.
		A1	cao SC: B1 for answer of 1495 if P0 scored	
11 (a)	Example	C1	for a correct example, eg 3 × 4 = 12 or 12 ÷ 3 = 4 **or** a statement eg '3 is a factor of 12' or '1 is a factor of every number'	This may be seen, for example, in a factor tree or in a list of factors, but there must be no incorrect factors on the tree or in the list
(b)	Example	C1	for an example, eg 23 **or** a statement eg. 'the tens digit may be even' or 'the last digit only needs to be odd'	

Question	Answer	Mark	Mark scheme	Additional guidance
12 (a)	100	B1	for answer in the range 95 to 100	
(b)	660	M1	for reading at least 3 of the required figures from the graph eg 3 of "100", 260, 120, 340, 160, 440 **OR** for 260 – "100" (= 160) **or** 340 – 120 (= 220) **or** 440 – 160 (= 280) **OR** for "100" + 60 (= 160) **or** 80 + 100 + 40 (= 220) **or** 40 + 100 + 100 + 40 (= 280)	Figures may be seen on graph
		M1	(dep) for adding their 3 differences eg "160" + "220" + "280"	
		A1	for 660 or ft their answer to part (a)	
(c)	Tablets	B1	Tablets	
	and statement	C1	Statement eg the bars get proportionally longer over time (most in 2017 and least in 2015) **or** they (more than) double each year **or** for an increase of 280 **or** numbers range from 60 to 340	Values quoted for tablets must be correct. Ignore any calculations relating to laptops and/or desktop computers whether correct or not. Award previous mark if "tablets" is not specifically stated but can be implied from statement.
(d)	Statement (supported)	C1	for statement, eg (No because) we do not know costs or prices or profit.	Answer of 'Yes' gets C0 Answer of 'No' without justification gets C0

Question	Answer	Mark	Mark scheme	Additional guidance
13	3	P1	for a start to the process eg 240 − (2 × 45) (= 150) oe **or** (2 × 45) + 40 (= 130) oe	
		P1	for complete process eg "150" ÷ 40 (= 3.75) – can be implied by 40 + 40 + 40 = 120 **or** "130" + 40 + 40 (= 210)	Considering just one piece of 45 cm is not a misread but (240 – 45) ÷ 40 (= 4.875) oe should be awarded P1 only
		A1	cao	
14	Isabel (supported)	P1	for process to work with $\frac{3}{4}$ eg $1 - \frac{3}{4} (=\frac{1}{4})$ oe, eg 25% or $\frac{25}{100}$ **or** $\frac{3}{4}$ = 75% or $\frac{75}{100}$ **or** value of salary (say 1000) × 3 ÷ 4 (= 750)	
		P1	for process to work with ratio 3 : 7 eg $\frac{3}{3+7}$ oe **or** $\frac{7}{3+7}$ oe **or** value of salary (say 1000) ÷ (3+7) (= 100)	
		A1	for (28(%)), 25(%) and 30(%) **or** 72(%), 75(%), 70(%) **or** 0.28, 0.25, 0.3 **or** for using value of salary (say 1000) giving 280, 250, 300 **or** 720, 750, 700	
		C1	(dep P2) for Isabel or ft their comparative values	"Isabel" alone without supported evidence, gets 0 marks.

Question	Answer	Mark	Mark scheme	Additional guidance
15	24	M1	for method to find 15% of 160, eg $160 \times \frac{15}{100}$ oe (= 24) **or** 10% = 160 ÷ 10 (= 16) plus 5% = "16" ÷ 2 (= 8) (= 24)	When using partitioning methods, the method to find individual %s must be clear including the need to show an intention to sum eg. 10% = 16 + 5%=8
		A1	cao SC B1 for answer of 136 or 184 if M0 scored	
16 (a)	14	M1	for 4 × 5 and 3 × −2, the substitution may be seen in two separate calculations, eg 4 × 5 (= 20) and 3 × −2 (=−6)	
		A1	cao	
(b)	$4e^2 + 8e$	B2	for $4e^2 + 8e$	
		(B1	for $4e^2$ or $8e$)	Note: $4e^2 + 8e = 12e^3$ for example gets B1 only
(c)	11	M1	for a correct first step eg 3 × m − 3 × 4 = 21 oe **or** m − 4 = 21 ÷ 3 (= 7) oe	Showing ÷3 by each side of equation is sufficient
		A1	cao	
17	1 : 3	M1	for $\frac{1}{4} : \frac{3}{4}$ oe **OR** for any correct un-simplified ratio, eg 25 : 75	
		A1	cao SC: B1 for an answer of 3 : 1 or 1 : $\frac{1}{3}$ if M0 scored	Ignore 'units' such as 1 nuts : 3 no nuts 1 : 3n gets M1A0

Question	Answer	Mark	Mark scheme	Additional guidance
18 (a)	15, 17, 19, 20, 21, 23, 25	M1	for listing either set eg 15,20,25 **or** 15,17,19,21,23,25 with no incorrect numbers	The 'lists' may be seen in a Venn Diagram or in the working space in part (b) provided they are not contradicted by incorrect lists in part (a)
		A1	15,17,19,20,21,23 and 25 with no repeats	If repeats (but no incorrect numbers) award M1 only.
(b)	Statement or 15 and 25	C1	eg odd multiples of 5 (between 14 and 26) oe NB Could be a general description, eg numbers that are in both (A and B), **or** 15 and 25 (ft from their sets A and B in part (a)) **or** numbers ending in 5 (between 14 and 26)	
19 (a)	$\dfrac{95}{28}$	M1	for a method to add using common denominators with at least one fraction correct (matching numerator with common denominator) eg $\dfrac{60}{28}+\dfrac{35}{28}$ **or** $(2)\dfrac{4}{28}+(1)\dfrac{7}{28}$	Use of decimals gets no credit unless it leads to a correct fraction
		A1	$\dfrac{95}{28}$ oe eg $3\dfrac{11}{28}$	
(b)	$1\dfrac{3}{5}$	M1	for $\dfrac{6}{5}\times\dfrac{4}{3}$ **or** $\dfrac{24}{20}\div\dfrac{15}{20}$ **or** $\dfrac{8}{5}$ oe eg $1\dfrac{9}{15}$	Use of decimals gets no credit unless it leads to a correct fraction
		A1	cao	

Question	Answer	Mark	Mark scheme	Additional guidance
20	140	P1	for beginning to solve the problem eg 50 ÷ 5 × 8 (= 80) **or** 14 : 8 : 5 oe **or** 14 : 8 and 8 : 5 oe (linked)	80 may be seen in the ratio 80 : 50
		P1	for a full process to solve the problem eg "80" ÷ 4 × 7 **or** $\frac{50}{5}$ × "14" **or** 140 : 80 : 50	
		A1	cao	If 140 clearly identified as houses in working award full marks
21	30	P1	for full process to find the number of bags sold eg 5 × 1000 ÷ 250 (= 20) **OR** for process to find selling price of 1 kg of sweets eg 0.65 × 4 (= 2.60)	This could be by repeated addition Calculations can be in £ or pence
		P1	for [number of bags] × 0.65 or "20" × 0.65 (= 13) **or** "2.60" × 5 (= 13) **OR** for 10 ÷ "20" oe (= 0.50) **OR** for 0.65 × 4 (= 2.60) **and** 10 ÷ 5 (= 2)	[number of bags] can only come from 5 × 10 ÷ 250 (= 0.2) or 5 × 100 ÷ 250 (= 2) or 5 ÷ 250 (= 0.02)
		P1	(dep on previous P1) for a process to find the percentage profit eg ("13" – 10) ÷ 10 × 100 **or** (0.65 – "0.50") ÷ "0.50" × 100 **or** ("2.60" – "2") ÷ "2" × 100 **OR** "13" ÷ 10 ×100 (= 130) oe	3/10 or 0.3 is not enough but should be awarded 2 marks Award P3 for 130(%)
		A1	cao	

Question		Answer	Mark	Mark scheme	Additional guidance
22	(a)	Estimated value	P1	for using a rounded value in a correct process eg 3000 ÷ 15 **or** 15 × 8 **or** 20 × 8	Their rounded value must be used in a calculation Rounding may appear after a correct process eg 15.12 × 8 = 120.96 ≈ 100 followed by eg 3069.25 ÷ 100
			P1	for a full process to find the number of days eg "3000" ÷ "15" ÷ "10" (= 20) **or** "3000" ÷ "15" ÷ 8 (= 25)	Accept 3069.25 ÷ 15.12 ÷ 8 oe
			A1	for a correct answer following through their rounded values	
	(b)	Explanation	C1	eg less days required **or** it doesn't affect the answer because I would still round 16.27 down to 15 (or up to 20)	Refers to time taken

Paper: 1MA1/1F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
23 (a)	isosceles triangle, base 6 cm, height 4 cm	M1	for drawing an isosceles triangle **or** for drawing a triangle of base 6cm and height 4cm	Accept a freehand drawing Only a single triangle is acceptable; do **not** accept any attempted nets or 3-D diagrams
		A1	for a fully correct diagram	Condone a perpendicular drawn from base to vertex
(b)	96 cm^2	M1	for a method to find the area of a triangular face eg ½ × 6 × 5 (= 15)	
		M1	(dep) for finding the total surface area eg 4 × "15" + 6 × 6	
		A1	for a numerical answer of 96 SC B1 for an answer of 84 if M0 scored	Ignore incorrect or absent units for this mark [The SC is from: 4 × ½ × 6 × 4 + 6 × 6]
		B1	cm^2	Ignore incorrect or absent numerical answer for this mark

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" ÷ 4 (= 8) **or** process to find half width of diagram eg "32" ÷ 2 (= 16)	
		P1	for process to find x coordinate eg 6 + 2 × "8" (= 22) **or** 6 + "16" (= 22) **or** (6 + 38) ÷ 2 (= 22)	If (6 + 38) ÷ 2 leads to an answer other than 22, award P2 only
		P1	for process to find y coordinate eg 36 – 2 × "8" (= 20) **or** 36 – "16" (= 20) **or** 7 + 8 + "29"– 3 × "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

Question	Answer	Mark	Mark scheme	Additional guidance
25	Line drawn	B3	for a correct line between $x = -3$ and $x = 3$	
		(B2	for a correct straight-line segment through at least 3 of $(-3, 13)$, $(-2, 9)$, $(-1, 5)$, $(0, 1)$, $(1, -3)$, $(2, -7)$, $(3, -11)$	Ignore any incorrect points
			or for all of these points plotted but not joined	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>
			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)	
		(B1	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 coordinates may be in a table or in working
26	$\begin{pmatrix} 9 \\ 11 \end{pmatrix}$	M1	for $\begin{pmatrix} 2\times5 \\ 2\times2 \end{pmatrix}$ $[= \begin{pmatrix} 10 \\ 4 \end{pmatrix}]$ or $2 \times 5 - 1 \,(= 9)$ or $2 \times 2 + 7 \,(= 11)$	
		A1	cao	

Modifications to the mark scheme for Modified Large Print (MLP) papers.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5°
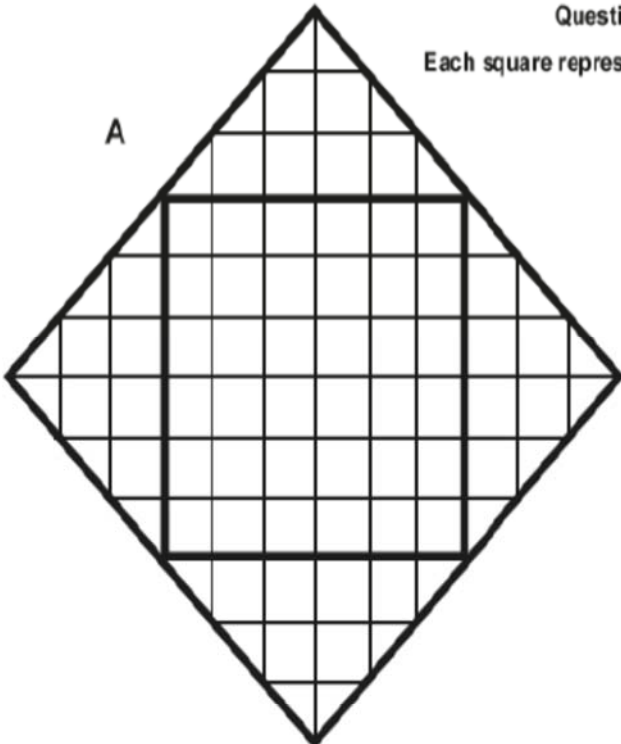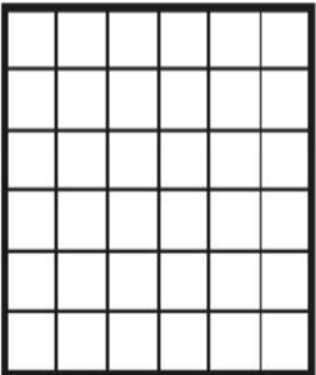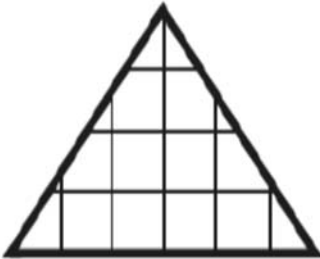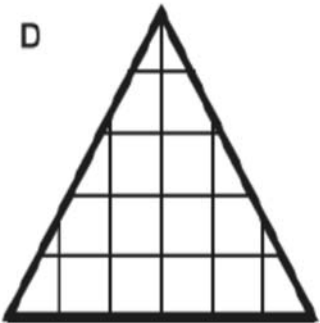Measurements of length: ±5 mm

Paper: 1MA1/1F				
Question		**Modification**	**Mark scheme notes**
2	(a)	Wording 'five' added	Standard mark scheme
2	(b)	Wording 'four' added	Standard mark scheme
6	(b)	Change to n	Standard mark scheme but a changed to n
7		Probability scale enlarged and crosses changed to solid circles; Lines at zero, a half and 1 lengthened	Standard mark scheme
9	(a)	Diagram enlarged. Wording added 'It shows a circle.' Deleted wording 'cross (x).' replaced with 'solid dot.' Cross changed to solid dot.	Standard mark scheme
9	(b)	Diagram enlarged	Standard mark scheme

Paper: 1MA1/1F		
Question	**Modification**	**Mark scheme notes**
12	Diagram enlarged. Right axis labelled. Key moved above and to the left of the diagram. Vertical axis label moved above the vertical axis. Shading changed. Intermediates added on both the horizontal and vertical axes. Graph lines changed as follows: 2015 – Laptops changed from 260 to 250; Tablets changed from 260 to 250 and 320 to 300. 2016 – Desktops changed from 120 to 100; Laptops changed from 120 to 100 and 340 to 350. 2017 - Desktops changed from 160 to 150; Laptops changed from 160 to 150 and 440 to 450 Tablets changed from 440 to 450 and 780 to 800	(a) Standard mark scheme (b) M1 for reading at least 3 of the required figures from the graph eg. 3 of 100, 250, 100, 350, 150 or 450 or finding 2 differences from 250 – 100 (= 150), 350 – 100 (= 250), 450 – 150 (= 300) M1 (dep) for complete method shown eg 150 + 250 + 300 A1 cao for 700

Paper: 1MA1/1F		
Question	**Modification**	**Mark scheme notes**
12 cont.		

Key:
- desktop computers
- laptops
- tablets

Paper: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
16	(a)	MLP only: *x* and *y* changed to *s* and *t*.	Standard mark scheme, except for MLP in the mark scheme read *s* for *x*, and *t* for *y*.
16	(b)	Braille only: e changed to q.	Standard mark scheme, except for Braille in the mark scheme read *q* for *e*
23	(a)	Model and a diagram provided. Diagram enlarged. Dashed lines made longer and thicker. Dotted lines made more obvious. Question reversed: Four different options of the front view of the pyramid have been provided. The pyramid has been put on page one for question 23(a) and the four shapes labelled A to D have been put on page two for question 23(a). Question changed to 'Look at the model or at the diagrams for Question 23(a) in the Diagram Book. They are shown on two pages in the Diagram Book. Page one shows a solid square-based pyramid, VABCD. The base of the pyramid is a square of side 6 cm. The height of the pyramid is 4 cm. M is the midpoint of BC and VM = 5 cm. Page two for Question 23 shows four shapes, labelled A, B, C and D. Each square represents a one centimetre square. Which shape shows the accurate front elevation of the pyramid from the direction of the arrow?'	Award 1 mark for an answer of D Award 2 marks for an answer of C NB: Accept any other unambiguous indication of the answer such the diagram indicated by circling etc.

Paper: 1MA1/1F		
Question	**Modification**	**Mark scheme notes**
23 cont.	Question 23 – page two Each square represents a one centimetre square. A B C D	

Paper: 1MA1/1F			
Question		**Modification**	**Mark scheme notes**
24		Diagram enlarged. Crosses changed to solid dots. Wording changed to 'It shows a pattern made from four identical squares.'	Standard mark scheme
25		Diagram enlarged. Y axis has been cut to go from -14 to 14.	Standard mark scheme