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Mark Scheme (Results)

Summer 2016

Pearson Edexcel GCSE
In Mathematics A (1MA0)
Foundation (Calculator) Paper 2F

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NOTES ON MARKING PRINCIPLES

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

2 Mark schemes should be applied positively.

3 All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e if the answer matches the mark scheme. Note that in some cases a correct answer alone will not score marks unless supported by working; these situations are made clear in the mark scheme. Examiners should be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

4 Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

5 Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

6 Mark schemes will award marks for the quality of written communication (QWC).
The strands are as follows:

i) *ensure that text is legible and that spelling, punctuation and grammar are accurate so that meaning is clear*
Comprehension and meaning is clear by using correct notation and labelling conventions.

ii*) select and use a form and style of writing appropriate to purpose and to complex subject matter*
Reasoning, explanation or argument is correct and appropriately structured to convey mathematical reasoning.

iii) *organise information clearly and coherently, using specialist vocabulary when appropriate*.
The mathematical methods and processes used are coherently and clearly organised and the appropriate mathematical vocabulary used.

With working

If there is a wrong 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.
If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
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, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Partial answers shown (usually indicated in the ms by brackets) can be awarded the method mark associated with it (implied).
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks; transcription errors may also gain some credit. Send any such responses to review for the Team Leader to consider.
If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

8 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, 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.

9 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: e.g. incorrect cancelling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

10 Probability

Probability answers must be given a fractions, percentages or decimals. 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 answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated 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).

12 Parts of questions

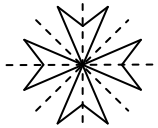
Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

13 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 includes all numbers within the range (e.g 4, 4.1)

14 The detailed notes in the mark scheme, and in practice/training material for examiners, should be taken as precedents over the above notes.

Guidance on the use of codes within this mark scheme
M1 – method mark for appropriate method in the context of the question A1 – accuracy mark B1 – Working mark C1 – communication mark QWC – quality of written communication oe – or equivalent cao – correct answer only ft – follow through sc – special case dep – dependent (on a previous mark or conclusion) indep – independent isw – ignore subsequent working

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		4726 in words	1	B1 accept 4 thousand 7 hundred and twenty six
	(b)		5 000 000	1	B1 cao
	(c)		3600	1	B1 cao
	(d)	7.04, 7.47, 7.58, 7.6 7.69	ordered	1	B1 cao
2	(a)		8	1	B1 cao
	(b)		Tuesday, Thursday	2	M1 for method to find total number of apples sold eg 4 + 6 + 8 + 9 + 3 (=30) A1 cao
3	(a)		2	1	B1 cao
	(b)			2	M1 for any 2 correct lines of symmetry, allow extras A1 for all 4 lines and no extras

PAPER: 1MA0_2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
4	30×8p + 40×4p = 400p 30×3p + 40×2p = 170p 400 – 170 = 230 OR (8 – 3) × 30 = 150p (4 – 2) × 40 = 80p 150 + 80 = 230	2.30	3	M1 for a complete method to find the cost for one company M1 for a complete method to find the cost for both companies and finding the difference A1 cao OR M1 for a complete method to find the differences in cost for calls or texts M1 for a complete method to find the amount saved and finding the sum A1 cao **SC:** B2 for an answer with digits 23
5 (a)		$\frac{7}{10}$	1	B1 cao
(b)		12 squares shaded	1	B1 for 12 squares shaded
(c)		64	3	M1 for 80 ÷ 5 (= 16) M1 (dep) for 80 – "16" or "16" × 4 A1 cao OR M1 for $1 - \frac{1}{5}$ $(=\frac{4}{5})$ M1 (dep) for "$\frac{4}{5}$"× 80 A1 cao

PAPER: 1MA0_2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
6 (a)		35	1	B1 cao
(b)		30	1	B1 cao
(c)		50	2	M1 for 35 – 10 (= 25) or 40 – 15 (= 25) or 35 + "30" – 15 oe A1 for 50 or f.t. from (b) + 20
7 (a)		24	3	M1 for using 1 kg = 1000 g M1 for dividing "5.4kg" by 450g or 10 × 450 + 900 = 5400 or 10 + 2 = 12 oe A1 cao NB: Candidates can work in kg and/or g
*(b)		No and explanation	4	M1 for a correct first step eg 90 + 30 (= 120) eg 5.4 × 20 (= 108 or 1h 48 m) M1(dep) for a complete method to get 6 18 pm or 2 12 pm or 228 or 3h 48m A1 for 6 18 pm or 2 12 pm or 228 **and** 210 or 18 or 3h 48m **and** 3h 30m C1 ft (dep on M2) for correct decision based on their figures
8 (a)		1, 5	1	B1 cao
(b)		Point D marked	1	B1 cao
9 (a)		2.7	1	B1 cao
(b)		9261	1	B1 cao

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
10	(a)		19	1	B1 cao
	(b)		21.5	2	M1 for evidence of adding all 10 numbers and dividing by 10 eg (20+14+21+19+27+31+19+19+24+21)÷10 or 215 ÷10 or $x \div 10$ seen where $205 \leq x \leq 225$ A1 cao
	(c)		96	3	M1 for 320 × 2.4 (= 768) or for 1000 ÷ 2.4 (= 416.6 or 416) M1 for (1000 – 320 × 2.4) ÷ 2.4 or for 1000 ÷ 2.4 – 320 or an answer of 96.6(66....) or 96.7 or 97 A1 cao
11	(a)		drawing	1	B1 cao
	(b)		9	1	B1 cao
	(c)		Yes (supported)	1	C1 for Yes with reason eg "the number of squares is always even (and 50 is even)" oe
	(d)		38	1	B1 cao
12	(a)		$\frac{1}{6}$	1	B1 for $\frac{1}{6}$ oe
	(b)		1	1	B1 cao

PAPER: 1MA0_2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
13 (a)		1270 or 1320	2	M1 for adding the six lengths or an answer of digits 127(0) or digits 132(0) A1 for 1270 or 1320
(b)		32 mm or 3.2 cm	1	B1 for answer in range 30 mm to 34 mm or in range 3 cm to 3.4 cm
(c)		Drawing	3	M1 for at least one right angle M1 for 10cm line or 12.5cm line A1 for fully correct drawing
14 (a)		$5m$	1	B1 cao
(b)		$4pr$	1	B1 cao
(c)		$7x + 3y$	2	B2 for $7x + 3y$ oe (B1 for $7x$ or $3y$ seen)
15		21	2	M1 for $ACD = 180 - 90 - 58$ oe (= 32) or for $CDB = 180 - 58$ (= 122) or for $x = 58 - 37$ A1 cao

PAPER: 1MA0_2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
*16		Bag A (supported)	3	M1 for $\frac{3}{7}$ or $\frac{5}{12}$ M1 (dep) for method to compare the two probabilities, e.g using a common denominator, eg $\frac{3}{7}=\frac{36}{84}$; $\frac{5}{12}=\frac{35}{84}$ or writing as decimals eg $\frac{3}{7}=0.428571...$ and $\frac{5}{12}=0.416666...$ C1 (dep on M2) for Bag A and correct method of comparison with correct figures using $\frac{3}{7}$ and $\frac{5}{12}$
17	**34** 44 78 42 **28** 70 76 **72** **148**	Complete table	3	B3 all correct (B2 for 5, 6, 7 or 8 correct) (B1 for any 2 of the 4 given correctly placed)
18		drawing	2	M1 for (quadrilateral with) at least 2 correct sides A1 cao

PAPER: 1MA0_2F					
Question		**Working**	**Answer**	**Mark**	**Notes**
19	(a)		45	2	M1 for 60 + 60 + 60 oe (= 180) or 0.75 × 60 oe A1 cao
	(b)		48	3	M1 for 120 ÷ 30 (= 4) or 720 ÷ 60 (= 12) M1 (dep) for "4" × "12" A1 cao OR M1 for 120 ÷ 60 (= 2) or 720 ÷ 30 (= 24) M1 (dep) for "2" × "24" A1 cao OR M1 for 720 × 120(= 86400) or 60 × 30 (= 1800) M1 (dep) for "86400" ÷ "1800" A1 cao
20	(a)		32.5	2	M1 for median value is 10.5^{th} evidenced by 10^{th} and 11^{th} seen or "31, 34" written or (31 + 34) ÷ 2 (condone missing brackets) or both 31 and 34 identified in the stem and leaf diagram or in a fully ordered list A1 for 32.5 (accept $32\frac{1}{2}$)
	(b)		32	2	M1 for 47 – 15 or 15 – 47 A1 cao
	(c)		7	1	B1 cao

PAPER: 1MA0_2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
21		9.25	3	M2 for $x + x + 4 + x + x + 4 = 45$ oe or $x + x + 4 = 22.5$ oe (M1 for $x + x + 4 + x + x + 4$ oe) A1 for 9.25 or $\frac{37}{4}$ oe OR M1 for $45 - 8$ (= 37) or $22.5 - 4$ (= 18.5) M1 for $(45 - 8) \div 4$ or $(22.5 - 4) \div 2$ A1 for 9.25 or $\frac{37}{4}$ oe
*22	400 ÷ 18 = 22(.2) 499 ÷ 20 = 24(.95) or 25 600 ÷ 26 = 23(.07…) (or equivalent in £) 18 ÷ 4 = 4.5 20 ÷ 4.99 = 4(.008…) 26 ÷ 6 = 4.3(333…)	18 pack (supported)	4	M1 for a method that would result in at least two values that could be used to compare two packs M1 for a method that would result in values that could be used to compare all three packs A1 for all fully correct figures suitable for comparison C1 ft (dep on M2) for comparison of their values with a correct conclusion from their figures

PAPER: 1MA0_2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
23 (a)		20.3	2	M1 for $\frac{50}{1.57^2}$ oe A1 for answer in range 20.2 to 20.3
(b)		68.04	2	M1 for (m =) $1.8^2 \times 21$ oe A1 cao
(c)		2.61	3	M2 for a complete method to find 145% of 1.8, eg. $\frac{145}{100} \times 1.80$ oe (M1 for a method to find 45% of 1.8, eg. $\frac{45}{100} \times 1.80$ (= 0.81) or for a multiplication factor of 1.45) A1 cao
24		Polygon drawn	2	B2 for correct frequency polygon (B1 for points plotted at correct midpoints of intervals or joining points at correct heights consistently within intervals including plotting at end values or correct frequency polygon with one point incorrect or correct frequency polygon with first and last points joined directly) NB ignore any histogram drawn and any part of frequency polygon outside range of first and last points plotted

PAPER: 1MA0_2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
*25		124° with reasons	4	M1 for a method to find any angle eg. angle *DEF* = 180 – 70 – 54 (= 56) or angle *AEB* = 70 or angle *EAB* = 54 or angle GEB = 180 – 70 (= 110) A1 for *x* =124 NB: Angles may be shown on the diagram C2 for full reasons, appropriate to their given method, with no additional reasons (C1 for one appropriate reason relating to parallel lines) Possible reasons: corresponding angles are equal; alternate angles are equal co-interior (allied)angles add up to 180; angles on a straight line add up to 180; angles in a triangle add up to 180 vertically opposite angles are equal; the exterior angle of a triangle is equal to the sum of the interior opposite angles; angles at a point add up to 360;

PAPER: 1MA0_2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
26		42.28	5	M1 for method to find weekly mileage eg. 18 × 2 × 5 (= 180) or weekly car park charge, eg. 3.50 × 5 (= 17.50) M1 for method to find fuel used in a relevant journey eg. 180 ÷ 45.2 (= 3.9823 gallons) or 18 ÷ 45.2 (= 0.39823 gallons) M1 for a correct use of the conversion factor to convert between gallons and litres eg. "3.9823"× 4.546 (= 18.1 … litres) or "0.39823" × 4.546 (= 1.81 …. litres) or 1.369 × 4.546 (= 6.22...£/gallon) or 45.2 ÷ 4.546 (= 9.942 miles/litre) M1 for a method to find the cost of a relevant journey eg. "18.1…" × 1.369 (= 24.78 …) or "1.81…" × 1.369 (= 2.478 …) or "3.9823" × "6.22.." (= 24.78...) A1 for answer in the range 42.26 to 42.3(0) NB candidates could work in litres or in gallons and/or could work in £ or p

Table for use in Question 26

Journeys in miles	Fuel used in gallons; miles ÷ 45.2	Fuel used in litres, gallons × 4.546	Cost of journey in £, litres × 1.369 or gallons × 6.22...
18	0.398...	1.81...	2.478...
36	0.796...	3.62...	4.956...
90	1.991...	9.05...	12.39...
180	3.98...	18.1...	24.78...
252	5.57...	25.3...	34.69...

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: ±5º
Measurements of length: ±5 mm

PAPER: 1MA0_2F			
Question		**Modification**	**Notes**
2		Diagram enlarged. Shading changed to dotty shading	Standard mark scheme
3	(a)	Diagram enlarged.	Standard mark scheme
	(b)	Diagram enlarged. Four shapes changed to convex kites	
5	(a)	Grid enlarged. Shading changed to dotty shading.	Standard mark scheme
	(b)	Grid enlarged	
6		Grid enlarged. Small squares removed.	Standard mark scheme
8		Grid enlarged. Crosses changed to filled in circles. Arrows changed to open headed arrows.	Standard mark scheme
11		The 3 patterns are placed vertically. Pattern number 3 is repeated below and labelled 'pattern number 4 (not completed).' Wording changed 'Pattern number 4 has been started below pattern number 3. Complete pattern number 4 on the diagram.' Wording 'grey' changed to 'shaded'. Grey shading changed to dotty shading.	Standard mark scheme

PAPER: 1MA0_2F			
Question		**Modification**	**Notes**
12		Diagram enlarged and straightened up. Spike removed and replaced with a filled in circle at the centre.	Standard mark scheme
13	(a) (b) (c)	Model provided for all candidates. Diagram enlarged and also provided for MLP. Diagrams placed on one page under each other. Diagram enlarged to 5 cm diameter. Diagram enlarged. *AB* line is 7.5 cm and placed under the sketch of the nest box. Braille only: Dimensions of diagram given in text.	Standard mark scheme
14	(c)	MLP only - *x* changed to *e*. *y* changed to *f*.	Standard mark scheme
15		Diagram enlarged. Wording added 'Angle *ADC* = 58°. Angle *ABC* = 37°. Angle *DCB* is marked *x*.'	Standard mark scheme
16		Diagram removed. Wording added 'There are two bags, labelled bag **A** and bag **B**. In bag **A** there are 3 black balls and 4 white balls. In bag **B** there are 5 black balls and 7 white balls.'	Standard mark scheme

PAPER: 1MA0_2F			
Question		**Modification**	**Notes**
17		Wording added ‘There are nine spaces to fill.’ Braille only: Two way table – Roman numerals put into spaces. (iii) (vi) (viii) (vii) (iv) (ix) (v) (ii) (i)	Standard mark scheme
18		Question changed. Two shapes are given on the grid, labelled shape P and shape Q. Question text has been changed to ‘It shows shape P and shape Q on a grid. Describe fully the single transformation that maps shape P onto shape Q.’	Mark scheme changed to: B1 for enlargement B1 (indep) for scale factor 2
19	(a)	Diagrams labelled ‘Diagram (i)’ and ‘Diagram (ii)’. Candidates are also referred to the diagram through the text. Diagrams enlarged. Wording added ‘They show Diagram (i) and Diagram (ii).	Standard mark scheme
	(b)	Diagrams enlarged and placed on the same page one under each other. Wording added ‘They show Diagram (iii) and Diagram (iv).’ Candidates are also referred to the diagram through the text. Diagrams labelled ‘Diagram (iii) and Diagram (iv).’	Standard mark scheme
20		Diagram enlarged. Base line added below ‘4’.	Standard mark scheme

PAPER: 1MA0_2F			
Question		**Modification**	**Notes**
21		Diagram enlarged. MLP only – x changed to y.	Standard mark scheme
22		Diagram removed. Information given in the text.	Standard mark scheme
24		The frequency values in the table have been changed to 10, 20, 10, 5 and 5. Grid enlarged. Right axis labelled.	Standard mark scheme
25		Diagram enlarged. Wording added ‘Angle *FBC* is marked *x*.’	Standard mark scheme

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