Mark Scheme (Results)

November 2017

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Calculator) Paper 2F

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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.

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.

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: 1MA1/2F				
Question	Working	Answer	Mark	Notes
1		0.07	B1	cao
2		42 or 48	B1	42 or 48
3 (a)		15*fg*	B1	cao
(b)		*t*²	B1	cao
(c)		4*n*	B1	cao
4 (a)		6	P1	for process to find the total weight of one type of fruit eg 4 × 125 (=500) or 2 × 170 (=340) or 3 × 135 (=405) or 1245
	1785−1245 =540		P1	complete process to find the total weight of oranges eg "1785" – ("500" + "340" + "405") or sight of digits 54 or answer given as 0.6 or 60
	540 ÷ 90		A1	cao SC B1 for answer of 15
(b)(i)		No	P1	Starts process, eg 1000 ÷ 75 (digits 13(.3..) seen) or 15 × 75 (= 1125) or 1.125 or showing 1000 ÷ 15 (=66(.6..)) or counts to 975 or 1050
		(supported)	C1	"No" with correct working eg as evidenced by work from P1 mark.
(b)(ii)		Comment	C1	for valid comment, eg may get enough tomatoes if tomatoes weigh less than assumed (75g), not if weight is more than 75g.

Question	Working	Answer	Mark	Notes
5 (a)		$\dfrac{33}{60}$	M1	for method to find number of students who did not walk to school eg 15 + 12 + 6 or 60 – 27 (=33) or 0.55 or for $1-\dfrac{27}{60}$
			A1	for $\dfrac{33}{60}$ or equivalent fraction
(b)		Pie chart drawn	M1	for method to find the angle for at least one sector eg $\dfrac{27}{60}\times360$, $\dfrac{12}{60}\times360$, $\dfrac{6}{60}\times360$, $27\div\dfrac{60}{360}$, $12\div\dfrac{60}{360}$, $6\div\dfrac{60}{360}$ oe (0.166..) NB: could be implied by one angle drawn accurately.
			M1	for drawing at least one sector accurately (from 4 sectors) eg 162°or 72°or 36°
			A1	for an accurately drawn pie chart
			B1	(dep on 4 sectors with at least one accurately drawn) for showing labels Walk Car Bicycle
6 (a)		$\dfrac{3}{7}$	B1	for $\dfrac{3}{7}$ or equivalent fraction
(b)		3 : 1	B1	for 3 : 1 or equivalent ratio

Question	Working	Answer	Mark	Notes
7		No	B1	for showing 11 or 13 or 17 or 19 with no non-prime numbers between 10 and 20, or for showing 23 or 29 with no non-prime numbers between 20 and 30. Ignore any numbers shown below 11.
		(supported)	C1	"No" supported by listing 11, 13, 17, 19 and 23, 29 and no non-prime
8 (a)		Statement	C1	States one thing wrong eg vertical scale is not linear oe
(b)		Trend described	C1	eg the trend is upwards, positive (trend) oe
9 (a)		2.75	M1	for accurately measuring the distance between Backley and Cremford as 5.3 cm – 5.7 cm oe or their measurement × 0.5 oe
			A1	for answer in the range 2.65 to 2.85
(b)		130	B1	for answer in the range 128 to 132
10 (a)		12 cm²	B1	for numerical answer of 12
			B1	for units shown as cm²
(b)		kite	B1	cao

Question	Working	Answer	Mark	Notes
11		5 : 2 : 10	P1	for process to calculate total for quiz or total of membership fees eg. $13 \times 5 + 35$ (=100), 25×20 (=500)
			P1	for complete process to write (correct) figures as a ratio, eg 250 : 100 : 500 oe in any order (condone inclusion of units or words)
			A1	cao
12 (a)		23, 177	C3	Completes all information correctly.
		10, 13, 85, 92	(C2	3 or 4 correct frequencies or all correct probabilities)
			(C1	2 correct frequencies)
(b)		$\dfrac{13}{23}$	M1	ft oe for $\dfrac{a}{23}$, $a < 23$ or $\dfrac{13}{b}$, $b > 13$
			A1	ft oe from (a)

Question	Working	Answer	Mark	Notes
13		Shown	M1	for method started to find comparable amounts, eg 17 × 46 (=782) or 17 × 0.46 (=7.82) or 17 × 35 (=595) or 266 ÷ 35 (=7.6) or 26600 ÷ 35 (=760)
			M1	for complete method to find comparable figures eg 17 × 46 (=782) or 17 × 0.46 (=7.82) AND 266 ÷ 35 (=7.6) or 26600 ÷ 35 (=760) eg 17 × 46 × 35 (=27370) or 17 × 0.46 × 35 (=273.7)
			C1	Shows correct comparable figures eg 7.82 and 7.6(0), 782 and 760 OR 273.7(0)
14 (a)		Example	M1	Chooses two odd numbers and substitutes into $2(a + b)$ oe
			C1	Calculates $2(a + b)$ correctly to arrive at a number that is a multiple of 4
(b)		Reasoning	C1	States $a + b$ is even or $2a$ is even or $2b$ is even
			C1	Completes argument.

Question	Working	Answer	Mark	Notes
15		988	P1	for a process to find the amount of oil bought in November, eg 750 ÷ 0.5 (=1500) or 75000 ÷ 50 (=1500)
			P1	for a process to find the amount of oil ordered in February, eg "1500" +1000 − 600 (= 1900)
			P1	(indep) for a process to calculate a 4% increase of their amount of oil, eg or "1900" × 1.04 (=1976) or increase in price eg 1.04 × 50 (=52 or 0.52) or 1.04 × 750 (=780)
			P1	for a complete process to find the total cost of the calculated amount of oil eg "52" × "1900" or "780" × "1900" ÷ "1500"
			A1	Cao
16		$1\frac{1}{2}$	M1	for correct expansion of the bracket or dividing all terms by 3 as a first step eg $3x -3$ or $(5x – 6)/3 = 3(x – 1)/3$
			M1	for isolating terms in x on one side of an equation eg $5x – 6 – 3x = -3$ or both constants on one side of an equation, eg $5x = 3x - 3 + 6$, ft $5x – 6 = 3x − 1$
			A1	for $1\frac{1}{2}$ oe
17	£6 − £5.64 = 36p or 50p – 47p = 3p	6.4	P1	for a strategy to compare the same number of bottles e.g. £5.64 ÷ 12 (= 47 or 0.47) or 12 × 50p (= 6 or 600) or 36 or 0.36 or 3 or 0.03
			P1	for start of process to find percentage profit e.g. $\frac{"36"}{564}$ or $\frac{"3"}{"47"}$ or $\frac{"6"}{5.64}$ or $\frac{50}{"47"}$ oe with consistent units
	6.3829787…%		A1	for answer in the range 6.3 to 6.4

Question	Working	Answer	Mark	Notes
18 (a)		31.4	P1	for working with circumference formula, eg $\pi \times 80$ (=251.(….)) oe
			A1	for answer in the range 31.4 to 31.5 accept 10π
(b)		No (supported)	C1	Mean distance stays the same with reason, eg total distance remains unchanged or same number of points
19		$\dfrac{1}{11}$	P1	for starting the process, eg by writing down a correct ratio or using a given number of cubes for one relationship, eg 2B 1Y or B:Y = 2:1 or 4G 1B or G:B = 4:1 or 8G, 1Y or G:Y = 8:1 oe or yellow = 2, blue = 4, or states 2:1:8 oe in any order (can be algebraic)
			P1	for complete process to find possible number of each colour or equivalent ratio, eg 8G 2B 1Y or G:B:Y = 8:2:1 oe or yellow = 2, blue = 4, green = 16 oe (can be algebraic)
			A1	$\dfrac{1}{11}$ oe
20 (a)		(−2, 1) (−4, 1) (−2, 2) (−5, 2)	B1	Shape labelled **A**
(b)		(1, −4) (3, −4) (1, −5) (4, −5)	B1	Shape labelled **B**

Question	Working	Answer	Mark	Notes
21 (a)		6	B1	cao
(b)		5	B1	cao
(c)		Shown	M1	for writing 100^a or 1000^b as a power of 10 (=10^{2a} or 10^{3b}) or $10^{2a + 3b}$ or $100 = 10^2$ and $1000 = 10^3$
			C1	for complete chain of reasoning leading to conclusion

Question	Working	Answer	Mark	Notes
22		32.3	P1	for using Pythagoras to find length of third side of triangle, eg $7.5^2 - 6^2$ or $6^2 + x^2 = 7.5^2$ or uses trigonometry to find angle in triangle eg $\sin A = \dfrac{6}{7.5}$ or $\cos B = \dfrac{6}{7.5}$
			P1	(dep P1) for complete process to find length of third side of triangle eg $\sqrt{7.5^2 - 6^2}$ or $\sqrt{56.25 - 36}$ or $\sqrt{20.25}$ (=4.5) or uses trigonometry to find base length of triangle eg $7.5 \times \cos$ "A" or $7.5 \times \sin$ "B" or $\dfrac{6}{\tan"A"}$
			P1	(dep P2) for $24 - 10 - $ "4.5" (= 9.5)
			P1	(indep) for process to find angle CDA, eg $\tan CDA = \dfrac{6}{base}$ from right-angled triangle
			A1	for answer in the range 32.2 to 32.3
23 (a)		2.7560…	M1	for 1.0654(059…), 0.1402(633…), 7.5957(541…), 2.756 truncated or rounded to no less than 2dp
			A1	for 2.7560(….)
(b)		2.76	B1	for 2.76 ft from (a)

Paper: 1MA1/2F				
Question	**Working**	**Answer**	**Mark**	**Notes**
24 (a)		±6	M1	for one value (6 or −6) or √36 or an embedded answer eg $2 \times 6^2 = 72$
			A1	±6
(b)	$6x^2 - 4x + 3x - 2$	$6x^2 - x - 2$	M1	for at least 3 terms correct out of a maximum of 4 from expansion, or 4 terms correct ignoring signs.
			A1	cao
(c)		$(x + 3)^2$	B1	for $(x + 3)^2$ or $(x + 3)(x + 3)$

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°
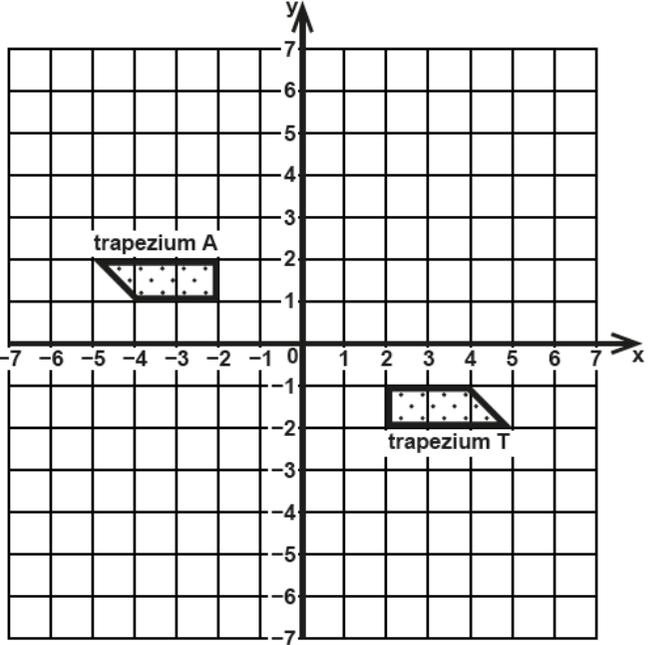Measurements of length: ±5 mm

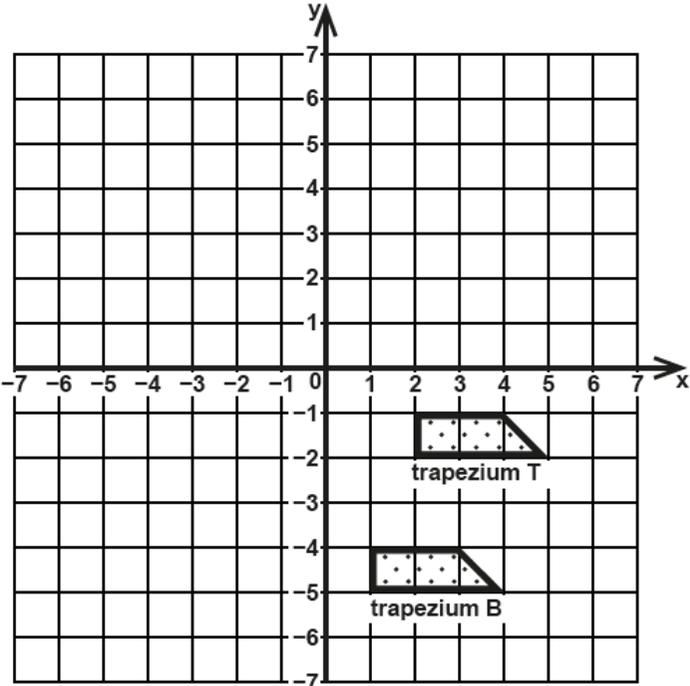| PAPER: 1MA1_2F		
Question	**Modification**	**Mark scheme notes**
5	Table has been turned to vertical format and left aligned. Numbers in the table have changed to: Bus: 15, Walk: 10, Car: 30 and Bicycle: 5. Then in part (b): Diagram enlarged. 10 degree markings have been added to the pie chart. Wording added 'It shows a pie chart.'	(a) M1 … eg 15+30+5 or 60 – 10 (=50) or 0.83(..) or 1 – 1/10 oe A1 for 5/6 or equivalent fraction (b) M1 for method to find the angle for at least one sector eg $\frac{10}{60} \times 360$, $\frac{30}{60} \times 360$, $\frac{5}{60} \times 360$, $10 \div \frac{60}{360}$, $30 \div \frac{60}{360}$, $5 \div \frac{60}{360}$ oe (0.166..) NB: could be implied by one angle drawn accurately. Then standard mark scheme for angles W: 60°, C: 180°, B: 30°
8	Diagram enlarged. Crosses have been changed to solid dots. Axes labels have been moved to the left of the horizontal axis and above the vertical axis.	Standard mark scheme

PAPER: 1MA1_2F		
Question	**Modification**	**Mark scheme notes**
9	Outline of the map has been removed. North lines have been made 10cm to allow for use of specialist equipment. Cremford point has been moved so the distance between Backley and Cremford is now 11cm. The scale has been moved above and to the left of the diagram. Question wording changed to 'It shows the position of two villages, Backley and Cremford.'	(a) M1 for accurately measuring the distance between Backley and Cremford as 10.8 cm – 11.2 cm oe or their measurement × 0.5 oe A1 for ans in the range 5.4 to 5.6 (b) standard mark scheme
10	Diagram enlarged. Shading removed. Shape P has been moved up one square. The grid has been reduced by removing a row from the bottom, top and right side. Wording changed to 'It shows two shapes drawn on a grid of squares. Each square on the grid represents a one centimetre square.' Labels 'P' and 'Q' removed from inside of the shapes and labelled 'shape P' and 'shape Q'.	Standard mark scheme
12	Diagram enlarged. Wording added 'It shows a frequency tree.' Wording added 'There are six spaces to fill.' Braille: will label the spaces to fill (i) to (vi).	Standard mark scheme
14	Braille only: a changed to s, b changed to t.	Standard mark scheme but for Braille letters changed as indicated.
18	Both diagrams enlarged and put on the same page in the diagram book. Wording changed to 'There are 8 points equally spaced on the circumference of the circle, as shown in the diagram for Question 18(a)'. Wording changed to 'Four of the points are moved, as shown in the diagram for Question 18(b)'.	Standard mark scheme

Question		Modification	Mark scheme notes
20		The grid has been split into two parts for part (a) and part (b).	
20	(a)	Question reversed. Trapezium T and A have been put on a grid. Question wording changed to 'It shows trapezium T and trapezium A given on a grid. Describe the single transformation that maps trapezium T onto trapezium A'. 3 answer lines and have been provided	B1 for "Rotation 180° about the origin"

PAPER: 1MA1_2F			
Question		**Modification**	**Mark scheme notes**
20	(b)	Question reversed. Question wording changed to 'It shows trapezium T and trapezium B given on a grid. Write down the vector that translates trapezium T onto trapezium B.' Vector brackets have been provided.	B1 for the vector $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$

PAPER: 1MA1_2F				
Question		**Modification**		**Mark scheme notes**
21	(c)	MLP and braille: a changed to e, b changed to f.		Standard mark scheme but for Braille letters changed as indicated.
22		Diagram enlarged. Arrows have been removed from 10cm and 6cm. Wording added 'BC = 10cm, AB = 7.5cm, AD = 24cm. The vertical height of the trapezium is 6cm.'		Standard mark scheme.
24		MLP and braille: x changed to y.		Standard mark scheme but for Braille letters changed as indicated.