Cambridge Assessment International Education

Cambridge IGCSE™

MATHEMATICS **0580/33**

Paper 3 (Core) **October/November 2021**

MARK SCHEME

Maximum Mark: 104

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2021 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

[Turn over

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

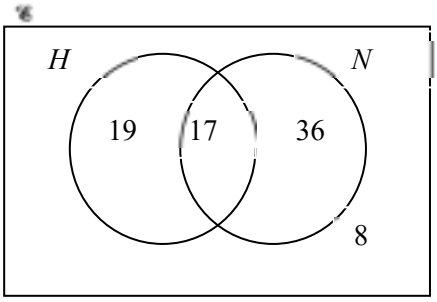
Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Maths-Specific Marking Principles	
1	Unless a particular method has been specified in the question, full marks may be awarded for any correct method. However, if a calculation is required then no marks will be awarded for a scale drawing.
2	Unless specified in the question, answers may be given as fractions, decimals or in standard form. Ignore superfluous zeros, provided that the degree of accuracy is not affected.
3	Allow alternative conventions for notation if used consistently throughout the paper, e.g. commas being used as decimal points.
4	Unless otherwise indicated, marks once gained cannot subsequently be lost, e.g. wrong working following a correct form of answer is ignored (isw).
5	Where a candidate has misread a number in the question and used that value consistently throughout, provided that number does not alter the difficulty or the method required, award all marks earned and deduct just 1 mark for the misread.
6	Recovery within working is allowed, e.g. a notation error in the working where the following line of working makes the candidate's intent clear.

Abbreviations
cao – correct answer only
dep – dependent
FT – follow through after error
isw – ignore subsequent working
oe – or equivalent
SC – Special Case
nfww – not from wrong working
soi – seen or implied

Question	Answer	Marks	Partial Marks
1(a)(i)	18 55	**2**	**B1** for 07 40 or 02 55 or 3[h] 15 [min] or **M1** for departure time + 11h 15 min − 8h evaluated as a time with one interval correctly added
1(a)(ii)	779 or 778.6 to 778.7	**3**	**M2** for 8760 ÷ 11.25 oe $\frac{8760}{675}\times 60$ or **B1** for 11.25 or **M1** for 8760 ÷ *their* time
1(b)((i)	$C = 56d + 436$ cao	**2**	**B1** for $C = 56d + 436$ seen and spoilt or $56d + 436$ as final answer
1(b)(ii)	0.29	**2**	**M1** for 1 – (0.17 + 0.24 + 0.3) oe or better
1(c)(i)	5000	**1**	
1(c)(ii)	4.986×10^3	**1**	
1(d)	1.4[0]	**1**	
1(e)(i)	35	**2**	**B1** for 7
1(e)(ii)	Correct length and bearing	**2**	**B1** for length 4 cm from *A* **B1** for bearing 072° from *A*
2(a)(i)	Bar at height 11	**1**	
2(a)(ii)	9	**1**	
2(b)	49.5	**2**	**M1** for $5 \times 9 + 4.5$ oe
2(c)	409.5[0] cao	**3**	**M2** for $36 \times 10.5 + 10.5 \times 1.5 \times 2$ oe or **M1** for 36×10.5 or $10.5 \times 1.5 \times 2$ or $36 + 1.5 \times 2$ oe
2(d)	9007 cao nfww	**3**	**B2** for 9007.[...] or **M1** for $8000 \times (1 + \frac{2.4}{100})^5$ oe If M0 or M1 scored, **SC1** for their decimal answer correctly rounded to the nearest dollar
2(e)	6400 3200 2400	**3**	**B2** for one correct answer in the correct place or **M1** for 12 000 ÷ (8+4+3) [× *k*] where *k* is 8, 4, 3 or 1

Question	Answer	Marks	Partial Marks
3(a)	8 4	**2**	**B1** for each
3(b)(i)(a)	Enlargement [centre] (–7, –5) [sf] 2	**3**	**B1** for each
3(b)(i)(b)	Rotation [centre] (0, 0) oe 180°	**3**	**B1** for each
3(b)(ii)	Triangle at (–3, 5), (–5, 5), (–5, 2)	**2**	**B1** for correct reflection in $x = k$ $k \neq -1$
3(b)(iii)	Triangle at (6, 4), (8, 4), (8, 1)	**2**	**B1** for a translation by $\begin{pmatrix} 5 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -1 \end{pmatrix}$
4(a)(i)	42	**1**	
4(a)(ii)	Acute	**1**	
4(b)	127	**3**	**B2** for 53 or **M2** for 180 – [(180 – 74) ÷ 2] or **M1** for (180 – 74) ÷ 2 or better
4(c)(i)	Chord	**1**	
4(c)(ii)	Angle in a semicircle = 90	**1**	
4(c)(iii)	113 or 113.0 to 113.1[...]	**2**	**M1** for $6^2 \times \pi$ oe
5(a)(i)	Fully correct net	**3**	**B2** for 4 more correct faces in correct position or **B1** for 2 or 3 more correct faces in correct position
5(a)(ii)	40	**2**	**M1** for 4 (4 × 2) + 2(2 × 2) oe
5(a)(iii)	600	**2**	**M1** for 3 ÷ 25 [× 5000] oe
5(b)	343	**3**	**M2** for $\sqrt{(294 \div 6)}^3$ oe or **M1** for 294 ÷ 6 or better

Question	Answer	Marks	Partial Marks
5(c)	23.5 24.5	**2**	**B1** for each If 0 scored, **SC1** for both correct but reversed
6(a)(i)	$\frac{60}{360}\times 600$ oe	**1**	
6(a)(ii)	45	**2**	**M1** for $\frac{27}{360}\times 600$ oe
6(a)(iii)	Correct straight line on the pie chart	**2**	**B1** for 75
6(a)(iv)	$\frac{3}{8}$ cao	**2**	**M1** for $\frac{100+125}{600}$ oe or $\frac{75+60}{360}$ oe
6(b)		**3**	**B1** for 8 **B1** for 17 **B1** for total in H equals 36 and total in N equals 53 provided $H \cap N \neq \emptyset$ If 0 scored, **SC1** for $36-x+x+53-x+8=80$ or better
7(a)	603 821	**1**	
7(b)	1.24	**2**	**M1** for $5-(0.47\times 8)$ oe
7(c)(i)	9	**1**	
7(c)(ii)	216	**1**	
7(c)(iii)	1	**1**	
7(d)	$2\times 5\times 13$	**2**	**B1** for 2, 5, 13 or **M1** for correct factor tree/diagram/list/ table
7(e)	1054	**3**	**B2** for 84 or 1 hr 24 mins or **M1** for $84k$ or $2\times 2\times 3\times 7$ or [12 =] $2\times 2\times 3$ and [14 =] 2×7 or 2 correct factor trees / tables of both 12 and 14 OR **M2** for listing times/multiples of both 12 and 14 to at least 1054 or 84 or **M1** for listing at least 3 of each or one full list

Question	Answer	Marks	Partial Marks
8(a)	$2.5x + 10$ final answer	**3**	**B2** for $2.5x + c$ OR **M1** for a correct rise over run or for a right-angled triangle marked on grid with rise =10 and run = 4 oe **B1** for $[y =] kx + 10$ ($k \neq 0$)
8(b)(i)	–4 21	**2**	**B1** for each
8(b)(ii)	Correct curve	**4**	**B3FT** for 9 or 10 points correctly plotted or **B2FT** for 7 or 8 points correctly plotted or **B1FT** for 5 or 6 points correctly plotted
8(b)(iii)	–5.8 to –5.6 and 1.6 to 1.8	**2**	**FT** *their* curve **B1** for each
9(a)	$6g$	**1**	
9(b)	5.5	**2**	**M1** for $4x = 27 – 5$ or $\frac{4x}{4} + \frac{5}{4} = \frac{27}{4}$ or better
9(c)	14	**1**	
9(d)	$4c + 2p = 20.60$	**B1**	
	$5c + 3p = 26.90$	**B1**	
	correctly equating one set of coefficients	**M1**	
	correct method to eliminating one variable	**M1**	Dependent on the coefficients being the same for one of the variables Correct consistent use of addition or subtraction using their equations
	$[c =] 4$	**A1**	
	$[p =] 2.30$	**A1**	If M0 scored, **SC1** for two values that satisfy one of the original or FT equations **SC1** if no working shown, but 2 correct answers given If A0A0 working in cents **SC1** for final answers of 400 and 230