Cambridge Assessment International Education

Cambridge IGCSE™

MATHEMATICS **0580/33**

Paper 3 (Core) **October/November 2023**

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 2023 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.

Mathematics-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, non-integer 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 or sign 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 A or B 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)	3.49	**2**	**M1** for 25.4[0] – (13.3[0] + 4.8[0] + 3.81) oe
1(a)(ii)	15	**1**	
1(b)(i)	960	**1**	
1(b)(ii)	2829	**2**	**M1** for $3450 \times \left(1 - \frac{18}{100}\right)$ oe or **B1** for 621
1(c)	15156 cao	**3**	**M1** for $14000 \times \left(1 + \frac{1.6}{100}\right)^5$ oe **A1** for 15156.4…, or 15156 or 15160 or 15200 If **A0** scored, **SC1** for correctly rounding *their* decimal answer to the nearest dollar
1(d)(i)(a)	72	**1**	
1(d)(i)(b)	120	**1**	
1(d)(ii)	Correct explanation, using any correct combination of values between 0 and 200 to reach 360 oe	**1**	
2(a)(i)	9	**2**	**B1** for 4.5 or **M1** for *their* 4.5 × 2
2(a)(ii)	*W* correctly placed	**2**	**B1** for correct bearing of 155° from *B* or for correct distance of 8.5 cm from *B*
2(b)(i)	1 hour 22 mins	**1**	
2(b)(ii)	12.75	**2**	**M1** for 17 ÷ *their* time
2(c)(i)	9.25	**1**	
2(c)(ii)	225.45 cao	**2**	**M1** for 3 × 9.8[0] + 57.3 + 138.75 oe or **B1** for 9.55

Question	Answer	Marks	Partial Marks
3(a)(i)(a)	$\frac{3}{16}$ cao	**2**	**M1** for $\frac{15}{80}$ oe
3(a)(i)(b)	380	**2**	**B1** for 500[g] or 120[g]
3(a)(ii)	25	**1**	
3(b)	1650 2200 3025	**3**	**B2** for one correct answer in the correct place or **M1** for $\frac{6875}{6+8+11}\times k$ oe where *k* is 1, 6, 8 or 11
3(c)(i)	3^0 final answer	**1**	
3(c)(ii)	0.0625 cao	**1**	
3(d)(i)	b^{15}	**1**	
3(d)(ii)	$\frac{m^2}{16}$	**1**	
3(e)	420	**2**	**B1** for $2^2 \times 3 \times 5 \times 7$ or $2 \times 2 \times 3 \times 5 \times 7$ or for 2,2,3,5,7 as final answer
3(f)	$\sqrt{7}$	**1**	
4(a)(i)	54 36	**2**	**B1** for each If 0 scored **M1** for $\frac{360}{100}$ or $\frac{270}{75}$ or 3.6
4(a)(ii)	Correct pie chart	**1**	**FT** dep on *their* 54°and *their* 36° adding to 90°
4(a)(iii)	4	**1**	
4(a)(iv)	41.25	**2**	**M1** for $\frac{8.25\times 75}{15}$ oe
4(b)	22.8	**2**	**M1** for 1.9 × 0.6 [× 2.5] [× 8] oe soi or **B1** for figs 228 as answer
4(c)	1.3×10^8	**1**	
4(d)(i)	Correct bars drawn	**2**	**B1** for shaded bar 55% or unshaded bar 70% or both bars of correct length
4(d)(ii)	Plastic Wood	**2**	**B1** for 1 correct and none incorrect or 2 correct and 1 incorrect

Question	Answer	Marks	Partial Marks
5(a)(i)	7	**1**	
5(a)(ii)	4	**2**	**M1** for an ordered list of at least the first 7 or last 7 values or **B1** for 3 and 5 both identified
5(b)	5.14	**3**	**M2** for $(4 \times 5.01 + 4.6 + 6.2) \div 6$ oe or **M1** for $4 \times 5.01 + 4.6 + 6.2$ or **B1** for 20.04
5(c)	125	**1**	
5(d)	94 or 94.00…	**2**	**M1** for $\frac{44 - 22.68}{22.68}$ [×100] or $\left(\frac{44}{22.68} - 1\right)$[×100] or $\frac{44}{22.68}$ ×100 [– 100]
5(e)(i)	Fully correct net	**2**	**B1** for 2 or 3 correct extra faces in correct places
5(e)(ii)	36 nfww	**1**	
6(a)(i)	TSR and SPQ (or TPQ) are corresponding angles oe	**1**	
6(a)(ii)	Trapezium	**1**	
6(a)(iii)	45	**2**	**B1** for [angle *PSR*=] 66 or **M1** for $y + 3y = 180$ or $114 + 66 + 3y + y = 360$
6(b)(i)	Rotation 90° clockwise oe (centre) (0, 0) oe	**3**	**B1** for each
6(b)(ii)	Translation $\begin{pmatrix} 3 \\ 8 \end{pmatrix}$	**2**	**B1** for each
6(b)(iii)	Triangle at (–2, 1), (7, 1), (–2, 4)	**2**	**B1** for enlargement SF 3 in wrong position

Question	Answer	Marks	Partial Marks
7(a)	8 15 22	**2**	**B1** for 2 correct in correct position in table
7(b)	51 is an odd number oe	**1**	
7(c)	82	**2**	**M1** for $3n + 3 = 249$ or $3(n + 1) = 249$ or better
7(d)(i)	$5n + 2$ oe final answer	**2**	**B1** for $5n + j$ or $kn + 2$ $k \neq 0$ as final answer or for $5n + 2$ oe seen then spoilt
7(d)(ii)	207	**1**	**FT** dep on *their***(d)(i)** in the form $an + b$ with $a \neq 0$
8(a)(i)	$6x + 10$ final answer	**2**	**B1** for $4x + 12$ or $2x - 2$ or for $6x$ or 10 in the final answer or for $6x + 10$ seen then spoilt
8(a)(ii)	$m^2 - 10m + 24$ final answer	**2**	**B1** for $m^2 - 6m - 4m + 24$ with at least three terms correct
8(b)	$\frac{p-3}{4}$ oe final answer	**2**	**M1** for $p - 3 = 4t$ or $\frac{p}{4} = t + \frac{3}{4}$
8(c)	9	**3**	**M2** for $4x + 2x + x = 49 + 15 - 1$ or better or **M1** for $4x - 15 + 2x + 1 + x$ [=49] oe
9(a)(i)	86.4	**2**	**M1** for ½ × 9.6 × 18 oe
9(a)(ii)	$\sqrt{9.6^2 + 18^2}$ leading to 20.4	**M2**	**M1** for $9.6^2 + 18^2$
9(a)(iii)	77[.0] or 77.02 to 77.05	**2**	**M1** for [½ ×] $\pi \times \left(\frac{20.4}{2}\right)^2$ soi
9(b)	12.6 or 12.62 to 12.63	**4**	**M3** for $\frac{34}{tan46} - 26 \times \sin 51$ oe or **M1** for $\sin 51 = \frac{RQ}{26}$ or better oe **M1** for $\tan 46 = \frac{34}{XY}$ or better oe
10(a)	$x = 1$ oe	**1**	
10(b)(i)	$6^2 - 2 \times 6 - 3$ [leading to 21]	**1**	

Question	Answer	Marks	Partial Marks
10(b)(ii)	–4	**1**	
10(c)	–3	**1**	