Cambridge Assessment International Education

Cambridge IGCSE™

MATHEMATICS **0580/33**

Paper 3 Core **October/November 2022**

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.

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This document consists of **8** printed pages.

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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.

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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.

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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)	1, 2, 4, 17, 34, 68	**2**	**B1** for 4 or 5 correct and no extras or 6 correct and one extra
1(b)(i)	$7 + 3 \times (5 - 1) = 19$	**1**	
1(b)(ii)	$(12 + 16) \div 2 + 5 = 19$	**1**	
1(c)(i)	$\frac{7}{2}$ or 3.5 or $3\frac{1}{2}$	**1**	
1(c)(ii)	1	**1**	
1(d)(i)	90	**1**	
1(d)(ii)	6	**1**	
1(d)(iii)	$\frac{1}{125}$ or 0.008	**1**	
1(e)	π, 3.142, $\frac{22}{7}$, $\sqrt{10}$, 1.8^2	**2**	**B1** for 4 in correct order or **M1** for [$\sqrt{10}$ =] 3.16…, [1.8^2=] 3.24, [π =] 3.141…, [$\frac{22}{7}$ =] 3.1428 to 3.1429 or 3.143
1(f)	$\frac{100 + 50}{60 \div 20}$	**M1**	
	50 cao nfww	**A1**	If 0 scored, **SC1** for 3 correct roundings or for all correct but with any trailing zeros
1(g)	4 730 000	**1**	
1(h)	31 or 37	**1**	
2(a)(i)	Any integer between 660 and 690	**1**	
2(a)(ii)	Yes, tallest bars [[Nov], Dec and Jan] occur when temperature is at its highest oe	**1**	
2(b)(i)	365	**2**	**B1** for 7.3 or **M1** for *their* 7.3×50

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Question	Answer	Marks	Partial Marks
2(b)(ii)	143	**1**	
2(b)(iii)	*B* correctly placed	**2**	**M1** for *B* on bearing of 068° from *M* or for *B* 6 cm from *M*
3(a)(i)	Seven hundred [and] thirty-five thousand, seven hundred [and] twenty	**1**	
3(a)(ii)	0.498 or 0.4980…	**1**	
3(a)(iii)	39.7 or 39.66 to 39.67	**1**	
3(b)	1568.5, 1569.5	**2**	**B1** for each If 0 scored, **SC1** for both values correct but reversed
3(c)(i)	2659	**1**	
3(c)(ii)	11	**1**	
3(c)(iii)	–36	**1**	
4(a)(i)	10 20 10 40	**1**	
4(a)(ii)	Line from (10 20, 0) to (11 50, 12) and from (11 50, 12) to (12, 12)	**2**	**B1** for line from (10 20, 0) to (11 50, 12) or **B1FT** for line from (*their* 11 50, 12) to (12, 12)
4(a)(iii)	11 30 9.2 to 9.6	**2**	**Strict FT** *their* graph **B1** for each
4(b)	14.7 or 14.69…	**2**	**M1** for $\frac{4067-3546}{3546}$ [× 100] or $\left(\frac{4067}{3546}-1\right)$[× 100] or $\frac{4067}{3546}$ × 100 [– 100]
4(c)(i)	9 : 11	**1**	
4(c)(ii)	2976	**3**	**B2** for 2016 or 2448 or **M1** for $\frac{432}{3}$[× *k*] oe, *k* is 1, 14 or 17
5(a)(i)	$x + 4 + \frac{x}{2} + 2x + \frac{x}{2} + x + 4$	**1**	

Question	Answer	Marks	Partial Marks
5(a)(ii)	3.2	**4**	**M3** for $75x = 240$ or $5x = 16$ or better OR **M2** for $75x + 120 = 360$ or $5x + 8 = \frac{360}{15}$ or better or **M1** for $15 \times (5x + 8) = 360$ oe **M1** for reaching $ax = d$ from *their* $ax + b = c$ If 0 scored, **SC1** for [length =] 24
5(a)(iii)	48	**1**	**FT** *their* **(a)(ii)** × 15
5(b)(i)	$3 \times 2 \times 4$ [= 24]	**1**	
5(b)(ii)	2700	**3**	**M2** for $18 \times 30 \times 65 - 24 \times 6 \times 15 \times 15$ oe or $(65 - 60) \times 30 \times 18$ oe or **M1** for $18 \times 30 \times 65$ or [24 ×] $6 \times 15 \times 15$ or $65 - 60$
	cm^3	**1**	
5(c)	9	**2**	**M1** for $6x^2 = 486$ oe or better
6(a)(i)	48 Alternate [angles]	**2**	**B1** for each
6(a)(ii)	123 Interior [angles] oe	**2**	**B1** for each
6(b)(i)	Isosceles	**1**	
6(b)(ii)	28	**1**	
6(b)(iii)	34	**3**	**FT** **M2** for $180 - 90 - 28 -$ *their* **(b)(ii)** oe or **B1** for 90
7(a)(i)	Points plotted at (3850, 715) and (2900, 530)	**1**	
7(a)(ii)	Positive	**1**	
7(a)(iii)	Ring around (3000, 900)	**1**	
7(a)(iv)	Correct ruled line	**1**	

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Question	Answer	Marks	Partial Marks
7(a)(v)	720 to 760	**1**	**FT** from *their* line provided positive gradient
7(b)	450	**1**	
7(c)(i)	671 or 670.7…	**2**	**M1** for $939 \div 1.4$ oe or $939 \div$ *their* time
7(c)(ii)	11 500 or 11 510 or 11 506.[…]	**2**	**M1** for $3.89 \times 939 \times 3.15$
8(a)(i)	Shape drawn at (–4, –3), (–3, –3), (–4, –5), (–3, –4)	**2**	**B1** for reflection in $y = k$, $k \neq -1$ or in $x = -1$
8(a)(ii)	Rotation 180° (0, 0) oe	**3**	**B1** for each
8(a)(iii)	Enlargement 3 (–7, 0)	**3**	**B1** for each
8(a)(iv)	9	**2**	**B1** for [area C =]13.5
8(b)(i)	$\begin{pmatrix}3\\4\end{pmatrix}$	**1**	
8(b)(ii)	Point C plotted at (10, 1)	**1**	
8(c)(i)	$\begin{pmatrix}15\\-36\end{pmatrix}$	**1**	
8(c)(ii)	$\begin{pmatrix}-1\\19\end{pmatrix}$	**1**	
9(a)	11	**3**	**M2** for $35 - 6 - 8 - \frac{2}{7} \times 35$ oe or **M1** for $\frac{2}{7} \times 35$ oe if 0 scored SC1 for answer of 15
9(b)(i)	$\frac{7}{15}$ $\frac{8}{15}$ $\frac{7}{15}$ $\frac{8}{15}$ $\frac{8}{15}$	**2**	**M1** for $\frac{8}{15}$ in first column or two correct values in diagram for counter 2

Question	Answer	Marks	Partial Marks
9(b)(ii)	$\frac{64}{225}$ oe	**2**	**FT** *their* tree diagram **M1** for *their* $\frac{8}{15}$ × *their* $\frac{8}{15}$
10(a)	Pattern 4 drawn correctly	**1**	
10(b)	9 17	**2**	**B1** for each
10(c)(i)	Add 2 oe	**1**	
10(c)(ii)	$2n + 1$ oe final answer	**2**	**B1** for $2n + j$ or $kn + 1$ $k \neq 0$ as final answer or for $2n + 1$ oe seen then spoilt
10(d)	65 nfww	**4**	**M1** for $4n + 1 = 129$ **A1** for $n = 32$ nfww **M1** for substitution of *their* 32 into ***their* (c)(ii)**