Cambridge Assessment International Education

Cambridge IGCSE™ (9–1)

MATHEMATICS **0980/32**

Paper 3 (Core) **May/June 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 May/June 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.

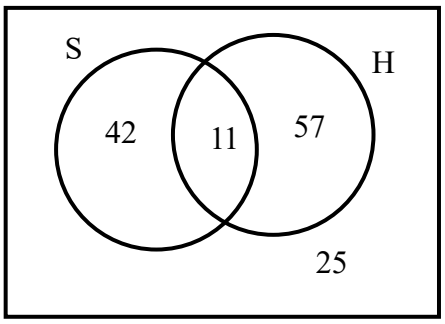
Maths-Specific Marking Principles	
1	Unless a particular method has been specified in the question, full marks may be awarded for any correct method. However, if a calculation is required then no marks will be awarded for a scale drawing.
2	Unless specified in the question, answers may be given as fractions, 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.

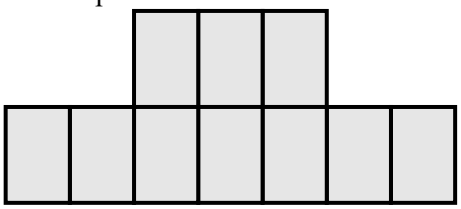
Abbreviations

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)	1 : 1.5 : 1.25 or 1 : $1\frac{1}{2}$: $1\frac{1}{4}$	**B1**	
	Working shown leading to 4 : 6 : 5	**M1**	
1(b)	47 500 ÷ 5 × (4 + 6 + 5)	**M2**	**M1** for 47 500 ÷ 5
1(c)(i)	38 000	**2**	**M1** for 142 500 ÷ 15 [× 4] or 47 500 ÷ 5 [× 4] oe soi
1(c)(ii)	57 000	**1**	**FT** for 95 000 – *their* **(c)(i)**
1(d)	38 608 cao	**3**	**M1** for $28\,000 \times \left(1+\frac{5.5}{100}\right)^6$ oe **A1** for 38 607.5… or 38 607.6 or 38 607 or 38 610 or 38 600 **B1** for *their* correctly rounded answer
1(e)	180 975	**2**	**M1** for $142\,500 \times \left(1+\frac{27}{100}\right)$ oe or **B1** for 38 475
2(a)	Pentagon	**1**	
2(b)	12	**2**	**B1** for 10 to 14
2(c)(i)	Translation $\begin{pmatrix}7\\4\end{pmatrix}$	**2**	**B1** for each
2(c)(ii)	Rotation [centre] (0, 0) oe 180°	**3**	**B1** for each
2(c)(iii)	Enlargement [centre] (4, 2) [scale factor] 0.5 oe	**3**	**B1** for each
2(d)	Correct reflection (−2, −2), (−1, −4), (−2, −6), (−4, −6) (−6, −4)	**2**	**B1** for a correct reflection in $x = 0$ or in $y = k$ $k \neq 0$ or for 4 correct points

Question	Answer	Marks	Partial Marks
3(a)(i)	13 30	**1**	
3(a)(ii)	4 [h] 25 [min]	**1**	
3(b)	Friday 12 20	**3**	**B1** for Friday, as final answer **B2** for 12 20, as final answer or **B1** for [0]6 20 or 22 35 or 19h 45 min or 12 20 seen then spoilt or **M1** for *their* arrival time of flight + 6 hours
3(c)	780.8	**2**	**M1** for 10 736 ÷ time of flight
3(d)	263.2[0] cao	**1**	
3(e)	125.4[0] cao	**2**	**M1** for $975.4 - 5 \times 170$ or better
4(a)	$\frac{49}{84}$	**1**	
4(b)	58% $\frac{7}{12}$ 0.6 $\frac{8}{13}$ $\frac{2}{3}$	**2**	**B1** for 4 in correct order or **M1** for 0.583[...], [0.6], 0.58, 0.615[…] or 0.61 or 0.62, 0.66[...] or 0.67 or 0.667 or 0.7 oe
4(c)	$\frac{181}{250}$ cao	**1**	
4(d)	412.5 417.5	**2**	**B1** for each If 0 scored, **SC1** for both correct but reversed
4(e)	6	**3**	**M1** for $7 \times \frac{3}{4}$ oe **A1** for 5.25 or $5\frac{1}{4}$
4(f)(i)	15.5[0]	**1**	
4(f)(ii)	$5t + 4p = 28.5$[0]	**1**	
4(f)(iii)	For correct method to eliminate one variable	**M1**	**FT** *their* two linear equations
	[t =] 2.5	**A1**	
	[p =] 4	**A1**	If 0 scored, **SC1** for 2 values satisfying one of the correct equations or *their* **(f)(i)** or **(f)(ii)** or **SC1** if no working shown, but 2 correct answers

Question	Answer	Marks	Partial Marks
5(a)	−2.25 −4.5 −9 9 4.5 2.25	**3**	**B2** for 4 or 5 correct or **B1** for 2 or 3 correct
5(b)	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
5(c)	2	**1**	
5(d)(i)	(−8, −3) and (6, 4) plotted and joined in a ruled line	**2**	**B1** for one point correctly plotted or both correctly plotted but not joined, or ruled
5(d)(ii)	−7.3 to −6.9 and 4.9 to 5.3	**2**	**B1FT** for each
5(d)(iii)	[$y =$] $\frac{1}{2}x + 1$ oe final answer	**2**	**B1** for $\frac{1}{2}x + c$ ($c \neq +1$) or $kx + 1\left(k \neq 0 \text{ or } \frac{1}{2}\right)$ or **B1FT** for (*their m*)x + c or kx + *their* intercept ($k \neq 0$)
6(a)(i)	87.6	**2**	**B1** for 7.1 to 7.5
6(a)(ii)	247	**1**	
6(a)(iii)	Point *C* correctly plotted	**3**	**B2** for line from *B* 8.3 cm to 8.7 cm long or **M1** for 102 ÷ 12 and **B1** for bearing 155° to 159°
6(b)	119 or 118.7...	**2**	**M1** for $98^2 + 67^2$ or better
7(a)(i)	120 72 24	**2**	**B1** for one correct angle
7(a)(ii)	Correct pie chart	**2**	**FT** *their* table if angles add up to 360° **B1FT** for one sector correctly drawn
7(a)(iii)	$\frac{2}{5}$ oe	**1**	
7(b)(i)		**3**	**B1** for 11 **B1** for 25 **B1** for total in *S* equals 53 and total in *H* equals 68 provided $S \cap H \neq \emptyset$
7(b)(ii)	11	**1**	**FT** *their* $S \cap H$

Question	Answer	Marks	Partial Marks
8(a)(i)	Acute	**1**	
8(a)(ii)	Isosceles	**1**	
8(a)(iii)	108	**2**	**B1** for angle $CAB = 36°$ or **M1** for $180 - 2 \times 36$ or $180 - 72$ oe
8(a)(iv)	36 Alternate [angles]	**2**	**B1** for each
8(b)(i)	Parallelogram	**1**	
8(b)(ii)	29	**1**	
8(b)(iii)	60 Angles [on a straight] line [add up to] 180	**2**	**B1** for each
8(b)(iv)	6	**1**	
8(b)(v)	$\sin 60 = \frac{h}{6.5}$ or better	**M1**	
	5.629 ...	**A1**	
8(b)(vi)	45.[0] or 45.03 to 45.04	**2**	**M1** for 5.63×8 or $5.629\ldots \times 8$ oe
9(a)	Correct pattern 4 	**1**	
9(b)	10 13	**2**	**B1** for each If 0 scored, **SC1** for Pattern 5 three more than *their* Pattern 4
9(c)	$3n - 2$ oe final answer	**2**	**B1** for $3n + j$ ($j \neq -2$) or $kn - 2$ ($k \neq 0$ or 3) or $3n - 2$ oe seen then spoilt
9(d)	28 nfww 2	**4**	**FT** **B3** for 28 nfww as answer or **B3FT** for *their n* correctly truncated or **B2** for 28.6 to 28.7 or **B2FT** for $n = \frac{(84 - \textit{their}\,\textbf{(b)})}{\textit{their}\,\textbf{(a)}}$ correctly evaluated or **M1** for *their* **(c)** = 84 or $3 \times 28 - 2 = 82$ or for adding up in threes up to 82 or 85