Cambridge Assessment International Education

Cambridge IGCSE™

MATHEMATICS **0580/31**

Paper 3 (Core) **May/June 2020**

MARK SCHEME

Maximum Mark: 104

Published

Students did not sit exam papers in the June 2020 series due to the Covid-19 global pandemic.

This mark scheme is published to support teachers and students and should be read together with the question paper. It shows the requirements of the exam. The answer column of the mark scheme shows the proposed basis on which Examiners would award marks for this exam. Where appropriate, this column also provides the most likely acceptable alternative responses expected from students. Examiners usually review the mark scheme after they have seen student responses and update the mark scheme if appropriate. In the June series, Examiners were unable to consider the acceptability of alternative responses, as there were no student responses to consider.

Mark schemes should usually be read together with the Principal Examiner Report for Teachers. However, because students did not sit exam papers, there is no Principal Examiner Report for Teachers for the June 2020 series.

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

Cambridge International is publishing the mark schemes for the June 2020 series for most Cambridge IGCSE™ and Cambridge International A & AS Level components, and some Cambridge O Level components.

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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

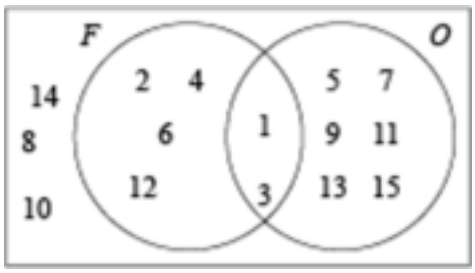
cao correct answer only
dep dependent
FT follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
nfww not from wrong working
soi seen or implied

Question	Answer	Marks	Partial Marks
1(a)(i)	112.5 ÷ 100 × 152 oe	**1**	
1(a)(ii)	3 ÷ 8 × 152 + 152 + 171	**2**	**B1** for 3 ÷ 8 × 152
1(b)	8 : 9 : 3	**2**	**B1** for 152 : 171 : 57
1(c)	8	**2**	**M1** for correct attempt e.g. 12 + 14 + 16 ….
1(d)(i)	6 ÷ 4 × 7	**1**	
1(d)(ii)	13.50	**1**	
1(d)(iii)	3228	**3**	**FT** *their* **(d)(ii)** **M2** for 120 × *their* **(d)(ii)** + 136 × 10.5 + 30 × 6 or **B1** for *their* 1620 or 1428 or 180
1(d)(iv)	71.7 or 71.7[3.....]	**1**	**FT** *their* **(d)(iii)**
2(a)	Kite	**1**	
2(b)(i)	Translation $\begin{pmatrix}4\\9\end{pmatrix}$	**2**	**B1** for each
2(b)(ii)	Reflection $x = 0.5$ oe	**2**	**B1** for each
2(b)(iii)	Rotation 90° clockwise oe [centre] (0, 0) oe	**3**	**B1** for each
2(c)(i)	(−5, −6)	**1**	
2(c)(ii)	Image at (−5, 0), (−2, 3), (7, 0),(−2, −3)	**2**	**B1** for correct size, wrong position or correct shape with incorrect scale factor
3(a)	Equilateral	**1**	
3(b)(i)	4.1 to 4.5	**1**	
3(b)(ii)	10.25 to 11.25	**2**	**M1** for 0.5 × 5 × *their* **(b)(i)**

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Question	Answer	Marks	Partial Marks
3(b)(iii)	61.5 to 67.5	**2**	**FT** *their* **(b)(ii)** **B1** for 6 seen
4(a)	4 7 4	**2**	**B1** for one correct
4(b)	Correct curve	**4**	**B3FT** for 6 or 7 points correct or **B2FT** for 4 or 5 points correct or **B1FT** for 2 or 3 points correct
4(c)	$x = 1$ oe	**1**	
4(d)	−1.9 to −1.7 and 3.7 to 3.9	**2**	**B1** for each
5(a)(i)	68	**1**	
5(a)(ii)	61, 67, 71, 73	**2**	**B1** for 3 correct and none incorrect or 4 correct and one incorrect
5(b)(i)	67	**1**	
5(b)(ii)	64	**1**	
5(b)(iii)	65	**1**	
5(b)(iv)	72	**1**	
5(c)	$\frac{1}{7}$	**1**	
5(d)	3.722	**1**	
5(e)	56	**2**	**B1** for $56k$ or lists of multiples of 8 and 14 (at least 3 of each)
5(f)(i)	12	**1**	
5(f)(ii)	17	**1**	
6(a)	Tangent	**1**	
6(b)(i)	22π final answer	**2**	**M1** for $2 \times 11 \times \pi$
6(b)(ii)	40	**2**	**B1** for angle $OBC = 40^\circ$ or angle $BOG = 140^\circ$
6(b)(iii)	7.68 or 7.679 to 7.680....	**2**	**FT** *their* **(b)(ii)** and **(b)(i)** **M1** for $\frac{\textit{their}\ \textbf{(b)(ii)}}{360} \times \textit{their}\ \textbf{(b)(i)}$
6(c)(i)	Angle [between] tangent [and] radius	**1**	

Question	Answer	Marks	Partial Marks
6(c)(ii)	180 – 140 or 90 – *their* **(b)(ii)**	**B1**	
	tan (180 – 140) = $\frac{11}{BC}$ oe	**M1**	
	[BC =] 13.109[...]	**A1**	
6(c)(iii)	6.11 or 6.112 to 6.114	**3**	**M1** for [OB^2 =] $13.11^2 + 11^2$ **A1** for 17.1 or 17.11 or 17.112 to 17.114 OR **M1** for $\frac{11}{\sin 40}$ oe **A1** for 17.1 or 17.11... or 17.112 to 17.113
7(a)(i)	[2] 1 5 9 [3] 0 1 2 2 5 6 7 9 9 [4] 0 0 4 6 7 8 [5] 1 3	**2**	**B1** for correct but not ordered or for 2 or 3 correct rows ordered
7(a)(ii)	32	**1**	
7(a)(iii)	38	**1**	
7(a)(iv)	Correct bar chart	**2**	**FT** *their* stem and leaf from **(a)(i)** **B1** for two heights correct
7(b)(i)	144 126	**2**	**B1** for each If 0 scored, **M1** for 90 ÷ 5 or 360 ÷ 20 or 18
7(b)(ii)	Correct pie chart	**2**	**FT** *their* **(b)(i)** angles if they total 270 **B1** for one correct sector
7(c)	2 correct expressions	**2**	**B1** for one statistical comparison **B1** for another comparison
8(a)	$2c - 3d$ final answer	**2**	**B1** for $2c$ or $-3d$
8(b)	[x =] 2.5	**2**	**M1** for $12x = 23 + 7$ or $x - \frac{7}{12} = \frac{23}{12}$
8(c)	$27 - 9x$	**1**	
8(d)	[h =] 8.4	**3**	**B2** for $38.64 = 4.6h$ or $77.28 = 9.2h$ or $\frac{2 \times 38.64}{5.5 + 3.7}$ or **B1** for $38.64 = \frac{(5.5 + 3.7)h}{2}$ or **M1** for [h=] $\frac{2A}{a+b}$
8(e)(i)	$3x = 5y$ oe $2y = x + 4$ oe	**2**	**B1** for each

Question	Answer	Marks	Partial Marks
8(e)(ii)	[x =] 20 [y =] 12	**3**	**M1** for correctly eliminating one variable **B1** for one correct
9(a)	$A \cup B$ $A \cap B$	**2**	**B1** for each
9(b)(i)		**2**	**B1** for 2 or 3 correctly completed regions
9(b)(ii)	One of 5, 7, 9, 11, 13, 15	**1**	**FT** *their* Venn diagram
9(b)(iii)	12	**1**	**FT** *their* Venn diagram
9(b)(iv)	$\frac{8}{15}$ oe	**1**	**FT** *their* Venn diagram
10(a)	Correct position of town B	**2**	**B1** for correct bearing **B1** for correct distance
10(b)(i)	Correct triangle drawn	**3**	**B2** for correct triangle with no or wrong arcs or correct position of C with arcs (no triangle) or **B1** for one line correct length drawn or 7 and 5 seen
10(b)(ii)	38 to 42	**1**	**FT** *their* measured angle at C

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