Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education (9–1)

MATHEMATICS **0980/03**

Paper 3 (Core) **For examination from 2019**

MARK SCHEME

Maximum Mark: 104

Specimen

This document consists of **6** printed pages.

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.

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)	2, 3, 4	**1**	
1(a)(ii)	2 or 3	**1**	
1(a)(iii)	7	**1**	
1(a)(iv)	7	**1**	
1(a)(v)	3	**1**	
1(b)(i)	9754	**1**	
1(b)(ii)	Nine thousand seven hundred [and] fifty four	**1**	**FT** *their* **(b)(i)** provided it has at least four figures
1(c)(i)	120	**1**	
1(c)(ii)	361	**1**	

Question	Answer	Marks	Partial Marks
2(a)	$11e - 6f$ as final answer	**2**	**B1** for either $11e$ or $-6f$ in their final answer
2(b)	67	**2**	**B1** for $8 \times 5 - 9 \times -3$ or 40 or +27
2(c)	9	**2**	**M1** for algebraic first step correct $4x = 29 + 7$ or $x - \frac{7}{4} = \frac{29}{4}$ or better
2(d)	k^{-7} oe	**1**	
2(e)(i)	220	**1**	
2(e)(ii)	$4p + 10w = 350$	**1**	
2(e)(iii)	[p =] 45, [w =] 17	**3**	**M1 FT** for correct elimination of one variable from *their* equations **A1** for $p = 45$ **A1** for $w = 17$ If zero scored, **SC1 FT** for 2 values satisfying one of *their* original equations

Question	Answer	Marks	Partial Marks
3(a)(i)	66.0 or 65.97 to 65.98 …	**2**	**M1** for $\pi \times 21$
3(a)(ii)	346 or 346.3 to 346.4 …	**2**	**M1** for $\pi \times (21 \div 2)^2$
3(b)(i)	90	**1**	

Question	Answer	Marks	Partial Marks
3(b)(ii)	$\sqrt{(21^2 - 9^2)}$	**2**	**M1** for $21^2 = AB^2 + 9^2$ or $[AB^2] = 21^2 - 9^2$
	18.97(……)	**1**	
3(c)(i)	85.5	**2**	**M1** for $0.5 \times 19 \times 9$
3(c)(ii)	87.5 or 87.65 to 87.823	**2**	**M1 FT** for $0.5 \times$ *their* **(a)(ii)** correctly evaluated
3(d)(i)	Tangent	**1**	
3(d)(ii)	Radius	**1**	
3(d)(iii)	33.3 or 33.27(……)	**2**	**M1** for $\tan[\ ] = \frac{(21 \div 2)}{16}$ or better

Question	Answer	Marks	Partial Marks
4(a)(i)	10	**1**	
	−2	**1**	
4(a)(ii)	6 points correctly plotted correct smooth curve	**3**	**B2 FT** for 5 or 6 points correctly plotted or **B1 FT** for 3 or 4 points correctly plotted
4(a)(iii)	(1.4 to 1.6, 10.1 to 10.4)	**1**	
4(b)(i)	6	**1**	
	3	**1**	
4(b)(ii)	5 points correctly plotted correct curve	**3**	**B2 FT** for 4 or 5 points correctly plotted or **B1 FT** for 2 or 3 correct points
4(c)	1.1 to 1.3	**1**	**FT** *their* graphs
	4.1 to 4.3	**1**	**FT** *their* graphs

Question	Answer	Marks	Partial Marks
5(a)(i)	Kite	**1**	
5(a)(ii)	1	**1**	
5(b)	12	**1**	
5(c)(i)	Translation	**1**	
	$\begin{pmatrix} 7 \\ -9 \end{pmatrix}$	**1**	
5(c)(ii)	Reflection	**1**	
	$y = -1$ oe	**1**	
5(c)(iii)	Enlargement	**1**	
	[Scale Factor] $\frac{1}{2}$	**1**	
	[Centre] (−6, 0)	**1**	

Question	Answer	Marks	Partial Marks
5(d)	Correct rotation	**2**	**B1** for a 'correct' rotation of 90° anti-clockwise or correct orientation but wrong position

Question	Answer	Marks	Partial Marks
6(a)(i)	$3\frac{1}{4} \times 60$ [= 195]	**1**	
6(a)(ii)	22 45	**2**	**B1** for [Total time =] 6 [hours] 30 [minutes] or $6\frac{1}{2}$ [hours] or 390 [minutes] or **M1** for adding to 16 15 *their* attempt at $3\frac{1}{4} + 2\frac{1}{2} + 45$
6(a)(iii)	13 : 10 : 3	**2**	**B1** for $3\frac{1}{4} : 2\frac{1}{2} : \frac{3}{4}$ or 195 : 150 : 45 or better or **SC1** for 13, 10, 3 in the wrong order in a ratio
6(b)(i)	78	**1**	
6(b)(ii)	30	**1**	
6(b)(iii)	87	**1**	**FT** 195 – (*their* **(b)(i)** + *their* **(b)(ii)**)
6(c)	8	**3**	**M2** for $\frac{22.5 - 20.7}{22.5} \times 100$ or better or **B1** for 22.5 – 20.7

Question	Answer	Marks	Partial Marks
7(a)(i)	15	**1**	
7(a)(ii)	65	**1**	
7(a)(iii)	4	**1**	
7(a)(iv)	64.77 or 64.8	**3**	**M1 FT** for 63 × 12 + 64 × 30 + 65 × 35 + 66 × *their* 15 + 67 × 8 **M1 FT** dep for *their* total ÷ 100
7(a)(v)	Line at 72° to the given line	**3**	**M2** for 288° or 72° or **M1** for $\frac{80}{100} \times 360$ or $\frac{20}{100} \times 360$
7(b)	64.5	**1**	If zero scored, **SC1** for correct but wrong way round
	65.5	**1**	

Question	Answer	Marks	Partial Marks
8(a)(i)	116	**2**	**B1** for 5.8 seen
8(a)(ii)	[0]65	**1**	

Question	Answer	Marks	Partial Marks
8(b)	Correct construction of point *C* with arcs	**2**	**B1** for correct position but no arcs or incorrect arcs or **B1** for one correct arc
8(c)	Correct point *D* with *AD* drawn	**3**	**B1** for [bearing] 135° **B1** for [*AD* =] 10 cm
8(d)	630 [m] to 646 [m]	**3**	**M2 FT** for *their* **(a)(i)** + 140 + 200 + *their CD* × 20 **M1 FT** for *their CD* or *their CD* × 20

Question	Answer	Marks	Partial Marks
9(a)	650	**1**	
	225	**1**	
	875	**1**	**FT**
9(b)	546 or 546.4 or 546.44 or 546.45	**2**	**M1** for 10 000 ÷ 18.3
9(c)(i)	1937 ÷ 2.83[3…] or 1937 ÷ 170 × 60	**1**	**M1**
	683.6 to 684.4.....	**1**	**A1** but not 684
9(c)(ii)	14 35	**2**	**B1** for 16 05 [time in Mumbai on arrival] or **B1** for 11 45 [time in Dubai on departure from Mumbai] or **M1** for 2 hours 50 mins – 1 hour 30 mins + 13 15 or **SC1** for answer 2 35pm