Cambridge Assessment International Education

Cambridge IGCSE™ (9–1)

MATHEMATICS **0980/02**

Paper 2 Non-calculator (Extended) **For examination from 2025**

MARK SCHEME B

Maximum Mark: 100

Specimen

This document has **12** pages. Any blank pages are indicated.

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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 descriptions 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 descriptions for the question
- the specific skills defined in the mark scheme or in the generic level descriptions 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 descriptions.

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 descriptions 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 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.

MARK SCHEME NOTES

The following notes are intended to help with understanding of mark schemes in general, but individual mark schemes may include marks awarded for specific reasons outside the scope of these notes.

Anything in the mark scheme which is in square brackets […] is not required for the mark to be earned, but if present it must be correct.

When a part of a question has two or more 'method' steps, the M marks are in principle independent unless the scheme specifically says otherwise; and similarly where there are several B marks allocated. The notation 'dep' is used to indicate that a particular M or B mark is dependent on an earlier mark in the scheme.

Types of mark

M Method mark, awarded for a valid method applied to the problem.

A Accuracy mark, given for a correct answer or intermediate step correctly obtained. For accuracy marks to be given, the associated Method mark must be earned or implied.

B Mark for a correct result or statement independent of Method marks.

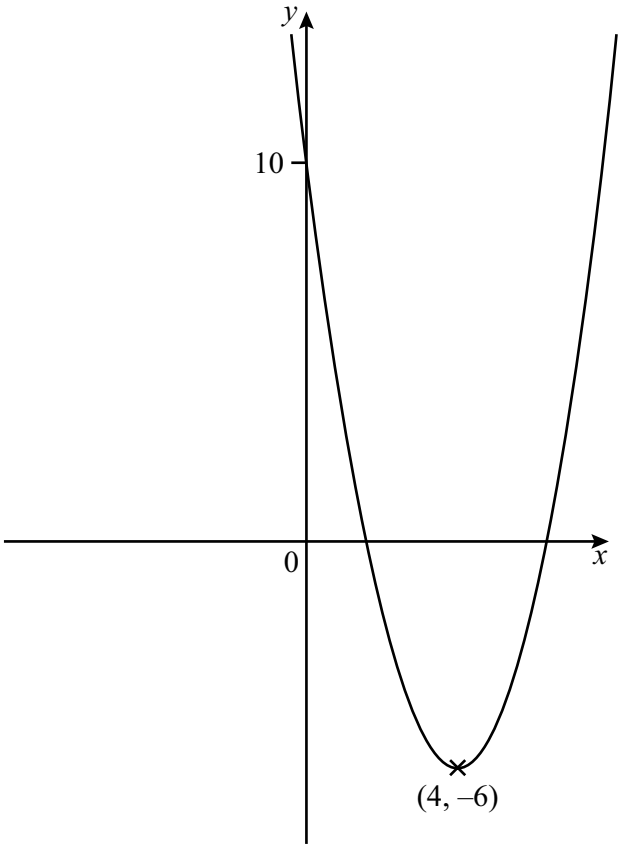
Abbreviations

awrt	answers which round to
cao	correct answer only
dep	dependent on the previous mark(s)
FT	follow through after error
isw	ignore subsequent working (after correct answer obtained)
nfww	not from wrong working
oe	or equivalent
SC	special case
soi	seen or implied

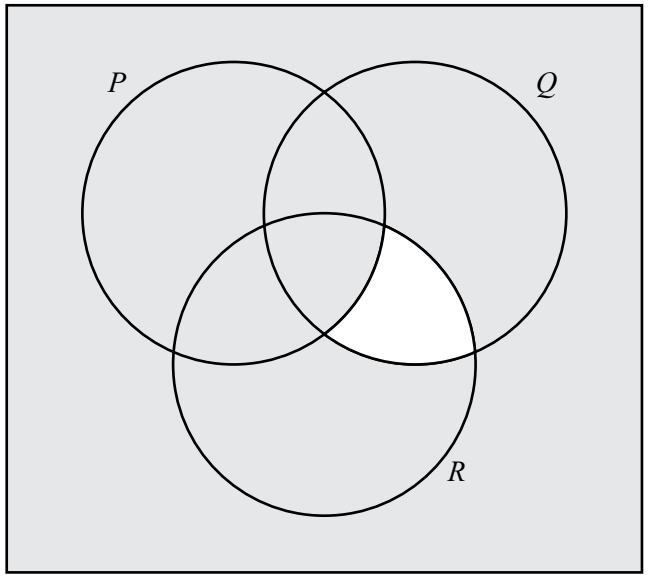
Question	Answer	Marks	Partial Marks
1	2 : 5 final answer	**1**	
2	1	**1**	
3(a)	27	**1**	
3(b)	26	**1**	
3(c)	80 160 120	**2**	**B1** for one correct or **M1** for $\frac{k}{18} \times 360$ where $k = 1, 4, 8$ or 6
4	$\frac{2}{5}$ final answer	**2**	**B1** for $\frac{42}{105}$ oe fraction or **M1** for correct cancelling seen of 3 with 15 **and** 7 with 14
5	144	**2**	**M1** for $180 - \frac{360}{10}$ oe or for $\frac{(10-2) \times 180}{10}$ oe
6	5700	**1**	
7	0.143, $\frac{3}{20}$, 16%, $\frac{1}{6}$	**2**	Accept correct equivalents in correct order for 2 marks **B1** for three values in correct order or **M1** for all four values correctly converted to the same form to enable comparison
8(a)(i)	$\frac{2}{8}$ oe	**1**	Accept fraction, percentage and decimal equivalents
8(a)(ii)	$\frac{5}{8}$ oe	**1**	Accept fraction, percentage and decimal equivalents
8(b)	60	**1**	**FT** *their* **(a)(i)** × 240 correctly evaluated FT dep on 0 < *their* **(a)(i)** < 1
9	Accurate rhombus with 2 sets of intersecting construction arcs for vertices	**3**	**B2** for accurate vertex of rhombus, [6 cm], 6 cm and 9.5 cm with correct arcs or **B1** for accurate rhombus with no/incorrect arcs

Question	Answer	Marks	Partial Marks
10	8 [hours] 20 [minutes]	**5**	**B4** for 500 mins OR **B2** for $\frac{19}{20}$ oe soi or **M1** for $\frac{3}{4}+\frac{1}{5}$ oe **M1 dep** on previous M1 or B2 for (1 – *their* $\frac{19}{20}$) × total time = 25
11(a)	$6x^3 - 16x^2$ final answer	**2**	**B1** for $6x^3$ or $-16x^2$
11(b)(i)	$(x + 19)(x – 19)$ final answer	**1**	
11(b)(ii)	6200	**2**	**M1** for (81 + 19) × (81 – 19) If 0 scored, **SC1** for 6561 or 361 seen
12	200 and 5 seen as rounded values and final answer 8	**3**	**M2** for $\frac{200}{5^2}$ or **B1** for 200 or 5 used as rounded values
13(a)(i)	Triangle drawn at (0, 3), (–2, 3), (–2, 6)	**3**	**B2** for triangle correct size and orientation but wrong position or for correct plots but no triangle or **M1** for $y = x + 2$ drawn
13(a)(ii)	Triangle drawn at (1,0), (1, 3), (5.5, 0)	**2**	**B1** for triangle correct size and orientation but wrong position
13(b)	Rotation 90° clockwise oe centre (–2, 1)	**3**	**B1** for each Award 0 marks if more than one transformation given
14	$\frac{7}{18}$ cao	**3**	**B2** for $\frac{35}{90}$ oe fraction or **M1** for [$100k – 10k$ =] 38.88… – 3.88… oe

Question	Answer	Marks	Partial Marks
15	20	**3**	**M2** for $k \times \left(\frac{100-10}{100}\right) \times \left(\frac{100-50}{100}\right) = 9$ oe or **M1** for $9 \div \left(\frac{100-50}{100}\right)$ oe or $9 \div \left(\frac{100-10}{100}\right)$ oe
16	$\sqrt{80}$ oe isw	**3**	**M1** for $\begin{pmatrix}3\\-1\end{pmatrix} + \begin{pmatrix}1\\9\end{pmatrix}$ or better **M1** for *their* $(3+1)^2$ + *their* $(-1+9)^2$ oe
17(a)	$12 + 5\pi$ final answer	**4**	**M1** for $k \times \pi \times 6^2 = 15\pi$, k may be $\frac{x}{360}$ **M2 dep** for *their* $k \times 2 \times \pi \times 6 + 2 \times 6$ oe where $k < 1$ or **M1 dep** for *their* $k \times 2 \times \pi \times 6$ oe where $k < 1$ (both dep on *their k* coming from a sector area calculation)
17(b)(i)	150π	**1**	
17(b)(ii)	$120 + 80\pi$	**3**	**M2 dep** for *their* **(a)** $\times 10 + 2 \times 15\pi$ oe (dep on *their* **(a)** in the form $a + b\pi$) or **M1** for *their* **(a)** $\times 10$ or $2 \times 15\pi$ seen oe
18(a)(i)	$(x-4)^2 - 6$ final answer	**2**	**M1** for $(x-4)^2$

Question	Answer	Marks	Partial Marks
18(a)(ii)	Correct sketch  and (4, –6) indicated as turning point in 4th quadrant FT *their* **(i)** and 10 marked as *y*-intercept	**3**	**B1** for positive U shape **B1** for 10 marked as *y*-intercept **B1FT** for (4, –6) indicated as turning point **FT** *their* **(i)** Max 2 marks if sketch not correct

Question	Answer	Marks	Partial Marks
18(b)	(7, 3)	**4**	**B3** for $x = 7$ OR **B2** for $2x - 8 = 6$ or **M1** for $\left[\frac{dy}{dx} =\right] 2x + k$ ($k \neq 0$) or for $kx - 8$ or **M1** for *their* $2x - 8 = 6$ if evidence of differentiation attempted, dep on 1 term correct
19(a)	$4\sqrt{3}$ cao	**2**	**M1** for $\left[\sqrt{75} =\right] 5\sqrt{3}$
19(b)	$-2(1 + \sqrt{5})$ or $-2 - 2\sqrt{5}$ final answer	**3**	**B2** for $\frac{8(1+\sqrt{5})}{1-5}$ or better or **M1** for $\frac{8}{1-\sqrt{5}} \times \frac{1+\sqrt{5}}{1+\sqrt{5}}$
20	$-6x^3 + 7x^2 + 7x - 6$ final answer	**3**	**B2** for correct expansion unsimplified or for simplified 4-term expression of correct form with 3 terms correct or **B1** for one pair of brackets expanded with at least 3 terms out of 4 correct
21	$\frac{9}{15}$ oe	**5**	**B2** for $AC = 12$ or **M1** for $\frac{6}{AC} = \sin 30$ oe or **B1** for $\sin 30 = \frac{1}{2}$ **B2FT** for $AD = \sqrt{9^2 + (\textit{their}\ 12)^2}$ or better or **M1** for $9^2 + (\textit{their}\ 12)^2$ oe (*their* 12 must come from trigonometry)

Question	Answer	Marks	Partial Marks
22(a)(i)	$\frac{2x}{10} = \frac{x+5}{x+5+7.5}$ oe	**M1**	
	$2x(x + 5 + 7.5) = 10(x + 5)$ oe	**M1**	
	Step with brackets expanded leading to $2x^2 + 15x – 50 = 0$	**A1**	with no errors or omissions
22(a)(ii)	$(2x – 5)(x + 10)$	**M2**	**M1** for $(2x + a)(x + b)$ where $ab = –50$ or $a + 2b = 15$ or for $2x(x + 10) –5(x + 10)$ or $x(2x – 5) + 10(2x – 5)$
	2.5 oe and –10	**B1**	
22(a)(iii)	15	**1**	**FT** dep *their* positive root + 12.5
22(b)	$\frac{3}{4}k$ oe	**2**	**FT** $\left(1 – \left(\frac{2 \times \textit{their } 2.5}{10}\right)^2\right)k$ or for $\left(1 – \left(\frac{5 + \textit{their } 2.5}{15}\right)^2\right)k$ **M1** for $\left(\frac{1}{2}\right)^2[k]$ oe or $2^2[k]$ oe **FT** *their* 2.5 and 15
23	$\mathscr{E}$ 	**1**	

Question	Answer	Marks	Partial Marks
24	$\frac{2d-3}{2+dy}$ oe final answer	**4**	**M1** for $d(2 - py) = 2p + 3$ **M1** isolating terms in p **M1** for removing p as a common factor **M1** for division by bracket to final answer Max **M3** if answer incorrect
25(a)(i)	1	**1**	
25(a)(ii)	$9m^4$ final answer	**3**	**B2** for answer $9m^k$ or km^4 or **B1** for $27m^6$ shown
25(b)	$-\frac{5}{6}$	**3**	**M2** for $5x + x + 3 = -2$ oe or **M1** for 2^{5x} and 2^{-2}

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