Cambridge Assessment International Education

Cambridge IGCSE™

MATHEMATICS **0580/04**

Paper 4 Calculator (Extended) **For examination from 2025**

MARK SCHEME

Maximum Mark: 100

Practice

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).

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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 or sign 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.

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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

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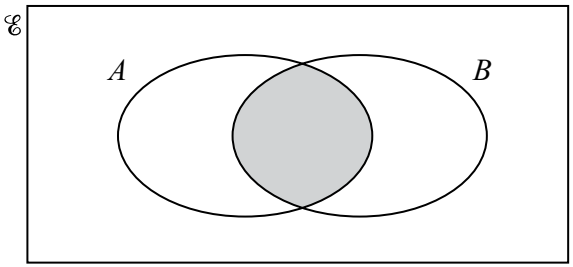
Question	Answer	Marks	Partial Marks
1	– 2	**2**	**M1** for (–3)(–2) + (–8)
2	Intersection shaded 	**1**	
3	Accurate triangle with correct construction arcs	**2**	**B1** for accurate triangle with no/incorrect arcs or **SC1** for accurate triangle with arcs with sides interchanged
4	0.0625	**1**	
5	$\frac{2p^2}{t}$ final answer	**2**	**B1** for correct unsimplified answer
6	285	**2**	**M1** for 180 + 105 or 75 or 105 seen in correct position at *B*
7	–14	**2**	**M1** for $1 - x = 3 \times 5$ or better or for $-\frac{x}{3} = 5 - \frac{1}{3}$
8	108	**3**	**M1** for (105 + 225) ÷ 11 **M1** for *their* speed × $\frac{60 \times 60}{1000}$
9	14 : 10	**2**	**M1** for 24 ÷ (7 + 5)
10	$\frac{3}{350}$ cao	**2**	**B1** for correct fraction not in lowest terms
11(a)	10.2[0]	**2**	**M1** for $\left(1 - \frac{15}{100}\right) \times 12$ oe or better or **B1** for 1.8[0]

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Question	Answer	Marks	Partial Marks
11(b)	45	**2**	**M1** for $\left(1-\frac{15}{100}\right)x = 38.25$ oe
12(a)	85	**2**	**M1** for $\frac{500\times1.7[\times10]}{100}$ oe
12(b)	203 or 202.5 to 202.6	**2**	**M1** for $200\times\left(1+\frac{0.0035}{100}\right)^{365}$ oe
13(a)	$125x^{12}$	**2**	**B1** for $125x^{k}$ or kx^{12}
13(b)	$8x^{96}$	**2**	**B1** for $8x^{k}$ or kx^{96}
14	25.6 or 25.59 to 25.60…	**4**	**M3** for $\frac{6.4}{2\times\pi\times8}\times\pi\times8^2$ oe or **M2** for $\frac{x}{360}=\frac{6.4}{2\times\pi\times8}$ oe or **M1** for $\frac{x}{360}\times2\times\pi\times8=6.4$ oe
15(a)	$\tan=\frac{350}{450}$ oe	**M1**	
	37.87...	**A1**	
15(b)	624 or 623.8 to 624.02	**6**	**M2** for $450-400\sin50$ or **M1** for $\sin50=\frac{\ldots}{400}$ **M2** for $350+400\cos50$ or **M1** for $\cos50=\frac{\ldots}{400}$ **M1** for (*their* $(450-400\sin50)$)^2 + (*their* $(350+400\cos50)$)^2
15(c)	10 min 8 s	**4**	**B3** for 10.1 or 10.13… or **M2** for (400 + 350 + 450 + *their DA*) ÷ 3 [÷ 60] oe or **M1** for any distance ÷ 3 **M1** for rounding *their* minutes into minutes and seconds to nearest second if clearly seen

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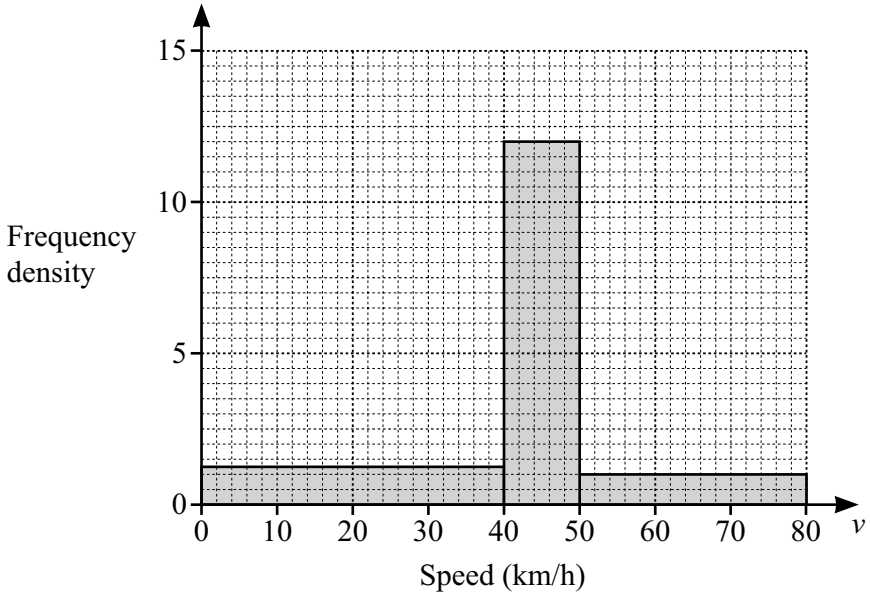
Question	Answer	Marks	Partial Marks
16(a)	41.4	**4**	**M1** for 10, 30, 42.5, 47.5, 55, 70 **M1** for $\sum fx$ where x lies in or on the boundary of each interval. **M1** dep for $\frac{\sum fx}{200}$ dep on second M1
16(b)(i)	112, 170	**1**	**FT** *their* cumulative frequency graph
16(b)(ii)	Correct cumulative frequency diagram	**3**	**B1** for correct horizontal plots **B1FT** for correct vertical plots **B1FT** dep on at least B1 earned for reasonable increasing curve or polygon through *their* 6 points If 0 scored **SC1FT** for 5 out of 6 points plotted correctly
16(b)(iii)	48	**1**	
16(c)	$\frac{87}{3980}$ oe	**2**	**M1** for $\frac{30}{200} \times \frac{29}{199}$
16(d)	Correct histogram  	**3**	**B1** for each column If 0 scored **SC1** for correct frequency densities soi 1.25, 12, 1

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Question	Answer	Marks	Partial Marks
17(a)	65.4 or 65.36 to 65.37	**3**	**M2** for $\sqrt{150^2 + 120^2 - 2 \times 150 \times 120 \cos 25}$ OR **M1** for $150^2 + 120^2 - 2 \times 150 \times 120 \cos 25$ oe **A1** for 4270 or 4272 to 4273
17(b)	125 or 124.7 to 124.8	**4**	**B1** for [angle S =] 80 **M2** for $\frac{150 \sin 55}{\sin(their\ 80)}$ oe or **M1** for $\frac{\sin(their\ 80)}{150} = \frac{\sin 55}{RS}$ oe
17(c)	10 400 or 10 410 to 10 440 nfww	**3**	**M1** for $\frac{1}{2} \times 120 \times 150 \times \sin 25$ oe **M1** for $\frac{1}{2} \times 150 \times$ *their* **(b)** $\times \sin 45$ oe
18(a)	$(x + 4)^2 - 25$	**2**	**B1** for $(x + k)^2 - 9 - (their\ k)^2$ or $(x + 4)^2$ oe
18(b)	$x + 4 = [\pm]\, 5$	**M1**	**FT** *their* **(a)**
	– 9 and 1	**A1**	**FT** *their* **(a)**
19	[b =] 7 [c =] –3	**3**	**B1** for [b =] 7 **M1** for $b^2 - 4c = 61$
20	64.9 or 64.89 to 64.90	**6**	**B5** for $\frac{100 + 72 - 100}{2 \times 10 \times \sqrt{72}}$ OR **M1** for $8^2 + 6^2$ **M1** for $6^2 + 6^2$ **M2** for $\frac{(their\ AF)^2 + (their\ AH)^2 - (their\ HF)^2}{2 \times (their\ AF) \times (their\ AH)}$ or **M1** for $(their\ HF)^2 = (their\ AF)^2 + (their\ AH)^2 - 2 \times (their\ AF) \times (their\ AH) \cos(HAF)$ *AF*, *AH* etc. from correct method

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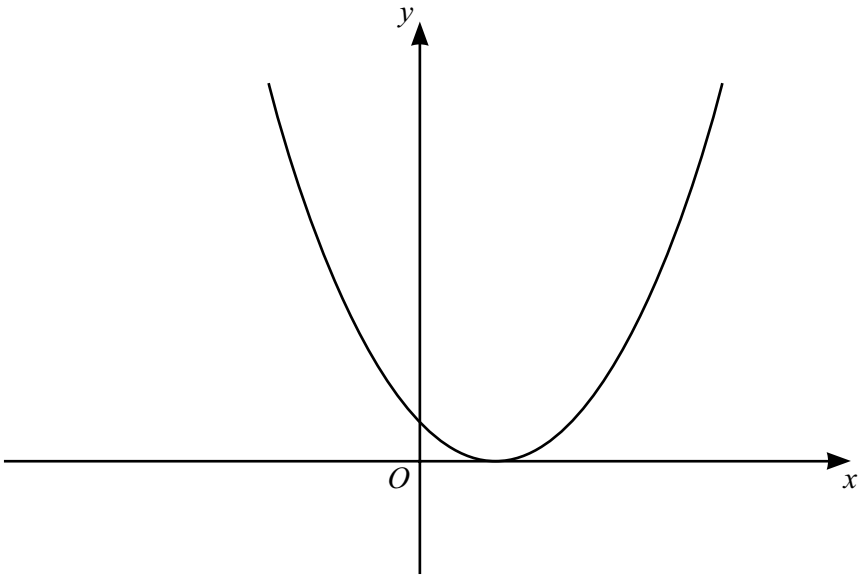
Question	Answer	Marks	Partial Marks
21(a)(i)	Correct sketch  	**2**	**B2** for correct quadratic curve with min touching x-axis or **B1** for parabola vertex downwards

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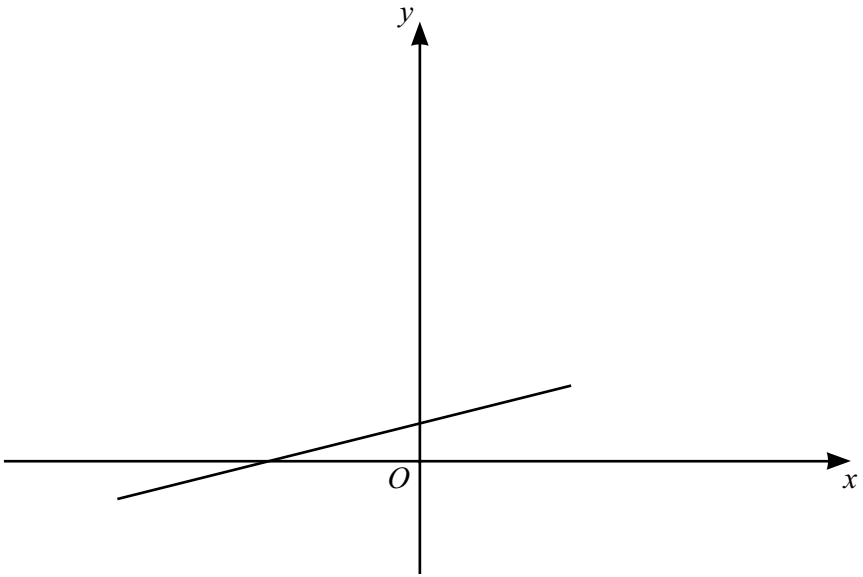
Question	Answer	Marks	Partial Marks
21(a)(ii)	Correct sketch  	**2**	**B2** for correct straight line intersecting curve on y-axis or **B1** for straight line with positive gradient and positive y-intercept
21(b)	2.8[0] or 2.795...	**7**	**B3** for $x^2 - \frac{5}{2}x = 0$ oe or **M1** for $(x-1)^2 = \frac{1}{2}x + 1$ **B1** for $[(x-1)^2 =]\ x^2 - x - x + 1$ AND **B2** for (0, 1) and $\left(\frac{5}{2}, \frac{9}{4}\right)$ oe or **B1** for $[x =]\ 0$ and $\frac{5}{2}$ AND **M1** for (difference in x)^2 + (difference in y)^2

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Question	Answer	Marks	Partial Marks
22	$\frac{2x-5}{a-2b}$ final answer	**5**	**B2** for $(2x – 5)(x + 3)$ or **B1** for $(2x + p)(x + q)$ where $pq = –15$ or $p + 2q = 1$ **B2** for $(x + 3)(a – 2b)$ or **B1** for $x(a – 2b) + 3(a – 2b)$ or $a(x + 3) – 2b(x + 3)$

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