CAMBRIDGE
International Education

# Cambridge IGCSE™

**MATHEMATICS** **0580/32**

Paper 3 (Core) **October/November 2024**

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 October/November 2024 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 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 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.

**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.

## MARK SCHEME NOTES

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

**Types of mark**

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

**A** Accuracy mark, awarded 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.

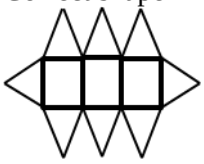
When a part of a question has two or more 'method' steps, the M marks are in principle independent unless the scheme specifically says otherwise; and similarly where there are several B marks allocated. The notation 'dep' is used to indicate that a particular M or B mark is dependent on an earlier mark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

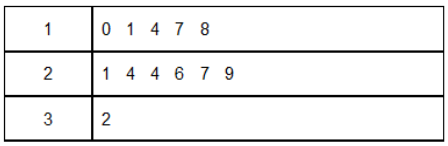
**Abbreviations**

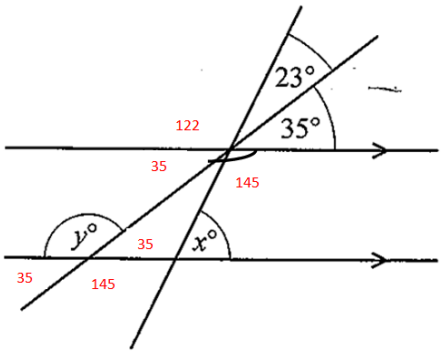
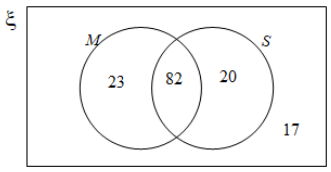
| | |
|---|---|
| cao | correct answer only |
| dep | dependent |
| FT | follow through after error |
| isw | ignore subsequent working |
| oe | or equivalent |
| SC | Special Case |
| nfww | not from wrong working |
| soi | seen or implied |

| Question | Answer | Marks | Partial Marks |
|---|---|---|---|
| 1(a) | 5.03 | **3** | **B2** for 14.97<br>OR<br>**M2** for 20 – (2.4 × 1.85 + 4.5 × 2.34) oe<br>or<br>**M1** for 2.4 × 1.85 or 4.5 × 2.34 soi |
| 1(b) | 11 23 | **1** | |
| 1(c) | Accept any correct method<br>e.g. $7 \times \frac{2}{3} = \frac{14}{3}$ | **M1** | Alt. method $2 \div \frac{2}{3} = 3$ [days] |
| | e.g. *their* $\frac{14}{3} \div 2 = \frac{7}{3}$ [bottles]<br>$2\frac{1}{3}$ so 3 [bottles needed] | **A1** | Alt. method $7 \div 3 = 2\frac{1}{3}$ so 3 [bottles needed] |
| 1(d) | 24 nfww | **2** | **M1** for $\frac{40}{5}$ [×*k*] , where *k* is 1,3 or 8 oe |
| 1(e) | 702 | **2** | **M1** for $520 \times (1 + \frac{35}{100})$ oe<br>OR<br>**B1** for 182 |
| 1(f) | USA 5 | **2** | **M1** for 3549 ÷ 4.2 oe<br>or (3549 – (840 × 4.2)) ÷ 4.2 oe |
| 2(a)(i) | 41 or 117 or 121 | **1** | |
| 2(a)(ii) | 14 | **1** | |
| 2(a)(iii) | 121 | **1** | |
| 2(a)(iv) | 41 | **1** | |
| 2(a)(v) | 117 | **1** | |
| 2(b) | 1 | **1** | |
| 2(c) | 2 × 2 × 3 × 5 or $2^2 \times 3 \times 5$ | **2** | **B1** for 2, 2, 3, 5<br>OR<br>**M1** for correct factor tree/table/list |
| 2(d) | 54 | **1** | |
| 2(e) | $\frac{70 \times 2}{5 + 30}$ | **M1** | |
| | 4 | **A1** | If **0** scored **SC1** for three correct from 70, 2, 5 and 30 or all correct but with trailing zeros |

| Question | Answer | Marks | Partial Marks |
|---|---|---|---|
| 2(f)(i) | $2.04 \times 10^9$ and it has the larger power of 10 oe | **1** | |
| 2(f)(ii) | $3.02[2...] \times 10^3$ or $3.023 \times 10^3$<br>or<br>$3.02[2...] \times 10^1$ or $3.023 \times 10^1$ | **2** | **B1** for 3020 or 3023 or 3022[. ...]<br>or correct value but not in correct form<br><br>or 30.2 or 30.23 or 30.2[2 ...]<br>or correct value but not in correct form<br><br>or for their value seen and correctly converted to standard form to at least 3 sf |
| 2(g) | 08 45 | **3** | **B2** for 480 or 8 mins<br>or **M1** for 480*k* or 2×2×2×2×2×3×5 or [96=] $2^5 \times 3$ and [120=] $2^3 \times 3 \times 5$<br>or two correct factor trees/tables of both 96 and 120<br><br>OR<br><br>**M2** for listing the times/multiples of both 96 and 120 up to 480 or 08 45<br>or **M1** for listing at least the next 2 of each or one full list |
| 3(a)(i) | Correct shape<br>  | **1** | |
| 3(a)(ii) | 12 | **1** | |
| 3(b)(i) | 4 −3 | **2** | **B1** for each or second number 7 less than first number<br>or for both answers correct but reversed |
| 3(b)(ii) | Subtract 7 oe | **1** | |
| 3(c)(i) | $3n + 2$ oe final answer | **2** | **B1** for answer $3n + c$ or $kn + 2$ ( $k \neq 0$) or correct answer seen then spoilt |
| 3(c)(ii) | $n^3$ oe final answer | **1** | |
| 4(a) | 2870 or 2867 to 2867.4 | **2** | **M1** for $\pi \times 7.8^2 \times 15$ oe |
| 4(b) | 1350 | **3** | **M2** for $\sqrt[3]{3375}^2$ oe or better<br><br>or **M1** for $\sqrt[3]{3375}$ oe |
| 4(c) | $5.4 \times 100^2 = 54\,000$<br>or $37\,000 \div 100^2 = 3.7$ | **M1** | |

| Question | Answer | Marks | Partial Marks |
|---|---|---|---|
| | Area *B* | **A1** | |
| 4(d) | 27.8 or 27.81… to 27.82 | **2** | **M1** for sin[...] = $\frac{7}{15}$ or better<br><br>or $90 - cos^{-1}\left(\frac{7}{15}\right)$ oe |
| 4(e) | 345.6 | **4** | **B3** for 28.8<br><br>OR<br><br>**M2** for $31.2^2 - 12^2$ oe<br>or **M1** for $[...]^2 + 12^2 = 31.2^2$ oe<br><br>**M1dep** for *their* 28.8 × 12 |
| 5(a)(i) | 5 | **1** | |
| 5(a)(ii) | 4.1 | **3** | **M1** for 1×2 + 2×4 + 3×8 + 4×7 + 5×12 + 6×7<br>**M1dep** for *their* 164 ÷ 40 |
| 5(b)(i) |  | **2** | **B1** for correct unordered diagram or for ordered diagram with one error or omission |
| 5(b)(ii) | 22.5 | **1** | **FT** their **(b)(i)** dep. on an ordered diagram |
| 5(c) | Correct pie chart | **4** | **B3** for 2 or 3 of 108°, 168° and 84° seen and 1 correct sector drawn<br>or<br>**B2** for 2 or 3 of 108°, 168° and 84° seen or 1 correct sector drawn<br>or<br>**B1** for 1 of 108°, 168° and 84° seen<br>or<br>**M1** for $\frac{360}{30}$ [× *k*] ( where *k* = 1, 7, 9 or 14) implied by 12<br><br>If **0** scored **B2FT** FT *their* angles for correct pie chart drawn if angles add to 360<br>or **B1FT** for one correct sector drawn |

| Question | Answer | Marks | Partial Marks |
|---|---|---|---|
| 6(a) | Fully correct net | **3** | **B2** for 3 or 4 extra faces in the correct places<br>**B1** for 1 or 2 extra faces in the correct places |
| 6(b) | 36 | **3** | **M1** for $180 - (\frac{360}{5})$ or $\frac{180(5-2)}{5}$ oe<br>**M1dep** for $360 - 3 \times$ *their* 108 oe |
| 6(c)(i) | 58<br>Corresponding | **2** | **B1** for 58 |
| 6(c)(ii) | 145 | **2** | **M1** for $180 - 35$ oe<br>or **B1** for any relevant angle marked on the diagram<br>  |
| 7(a)(i) |  | **2** | **B1** for 2 or 3 numbers in the correct places |
| 7(a)(ii) | 125 | **1** | **FT** *their* diagram with one value in each of the 3 regions of M and S, providing total <142 |
| 7(a)(iii) | $\frac{20}{142}$ oe | **1** | **FT** $\frac{\textit{their}\,20}{142}$ providing *their* 20 < 142 |
| 7(b) | $A \cap B$ | **1** | |
| 7(c) | 10 550 10 650 | **2** | **B1** for one correct<br>or **SC1** for both correct and reversed |
| 7(d) | 8 nfww | **2** | **M1** for $\frac{17064-15800}{15800}$ [× 100]<br>or $\left(\frac{17064}{15800}-1\right)$[× 100]<br>or $\frac{17064}{15800}\times 100$ [- 100] oe |

| Question | Answer | Marks | Partial Marks |
|---|---|---|---|
| 7(e) | 14 720 | **2** | **M1** for $\frac{18400}{1+4}$ [× $k$] (where $k$ = 1 or 4) oe |
| 8(a)(i) | [$y$ =] $\frac{1}{2}x + 2$ final answer | **2** | **B1** for $\frac{1}{2}x + c$ or $y = \text{m}\,x + 2$<br>where $m$ is *their* gradient and $m \neq 0$ |
| 8(a)(ii)(a) | 8 [4] 0 | **2** | **B1** for each |
| 8(a)(ii)(b) | Correct graph | **1** | |
| 8(a)(iii) | 2.4 3.2 | **1** | **FT** *their* graph |
| 8(b)(i) | 1 −7 −7 1 | **2** | **B1** for 2 or 3 correct |
| 8(b)(ii) | Correct curve | **4** | **B3FT** for 8 or 9 points plotted correctly<br>OR<br>**B2FT** for 6 or 7 points plotted correctly<br>OR<br>**B1FT** for 4 or 5 points plotted correctly |
| 8(b)(iii) | $x$ = 2 oe | **1** | |
| 8(b)(iv) | −0.7 to −0.9<br>4.7 to 4.9 | **2** | **FT** *their* graph **B1** for each |
| 9(a) | Correct translation to (–4, –3),<br>(–1, –3) and (–2, –1) | **2** | **B1** for translation by $\begin{pmatrix}-5\\k\end{pmatrix}$ or $\begin{pmatrix}k\\-4\end{pmatrix}$ |
| 9(b) | Reflection<br>$y$ = −1 oe | **2** | **B1** for each |
| 9(c) | Rotation<br><br>[centre] (0,0)<br><br>90° [anti-clockwise] | **3** | **B1** for each |