CAMBRIDGE
International Education

Cambridge O Level

MATHEMATICS SYLLABUS D (MAURITIUS) **4029/02**

Paper 2 **October/November 2024**

MARK SCHEME

Maximum Mark: 100

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.

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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 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.

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)	35	**2**	**M1** for $\frac{84}{96+84+60}[\times 100]$ oe
1(b)	420	**2**	**M1** for $\frac{\text{figs } 14}{3+7} \times k$ where k = 1, 3 or 7 or **B1** for 1000 ml = 1 litre soi
1(c)	2.1[0]	**2**	**M1** for $\frac{1.5[0]}{125}$ oe or $\frac{175}{125}$ oe or $175 \div \frac{125}{1.50}$ oe
1(d)	465	**2**	**M1** for (100 – 62)% oe equated to 285 soi
1(e)	[UB =] 157.5 [LB =] 142.5	**3**	**B2** for one answer correct or for both answers correct but reversed or **B1** for two of 495, 505, 347.5, 352.5 seen
2(a)(i)	4 points plotted correctly	**2**	**B1** for 2 or 3 correct plots
2(a)(ii)	Ruled line of best fit	**1**	
2(a)(iii)	Reading from *their* ruled line of best fit at 7 years	**1**	
2(a)(iv)	Outside range of data oe OR 12 would give a negative value [which is impossible] oe OR The line of best fit does not go as far as 12 oe	**1**	
2(b)(i)	$\frac{14}{25}$ cao	**1**	
2(b)(ii)	$50 < d \leqslant 60$	**1**	
2(b)(iii)	55.9	**3**	**B1** for correct midpoints soi **M1** for $\frac{8\times 25+14\times 45+11\times 55+17\times 80}{50}$
3(a)(i)	2.5	**2**	**M1** for $1.2 \times 0.6 \times h = 1.8$ oe
3(a)(ii)	8 [minutes] 6 [seconds]	**3**	**M2** for $\frac{1.8}{0.2} \times \frac{90}{100}$ oe or **M1** for $\frac{1.8}{0.2}$ or $1.8 \times \frac{90}{100}$ isw

Question	Answer	Marks	Partial Marks
3(b)	30 600 or 30 590 to 30 591[. …]	**5**	**M2** for $\sqrt{70^2-\left(\frac{110-80}{2}\right)^2}$ or **M1** for $70^2=\left(\frac{110-80}{2}\right)^2+h^2$ **M1dep** for $\frac{1}{2}(110+80)\times$ *their* 68.37 oe **M1** for 80 × 80 oe and [2 ×] 80 × 70 oe
4(a)	9.5[0]	**3**	**M2** for 100 – 21.50 – 3 × 13.50 oe or **M1** for 100 – 21.50 oe or 3 × 13.50 oe
4(b)	3.85 cao	**2**	**M1** for 140 ÷ 0.91 oe or (140 – 150 × 0.91) ÷ 0.91 oe
4(c)	1.2[0] nfww	**3**	**M2** for $\sqrt[3]{\frac{621.86}{600}}$ oe or **M1** for $600k^3 = 600 + 21.86$ oe
5(a)	$\frac{4}{9}$ oe	**1**	
5(b)	$\frac{4}{81}$ oe	**2**	**M1** for $\frac{2}{9}\times\frac{2}{9}$ oe
5(c)	$\frac{5}{18}$ oe	**3**	**M2** for $\frac{5}{9}\times\frac{4}{8}$ oe or $[2\times]\left(\frac{3}{9}\times\frac{2}{8}\right)+\left(\frac{3}{9}\times\frac{2}{8}\right)+\left(\frac{2}{9}\times\frac{1}{8}\right)$ oe or **M1** for $\left(\frac{k}{9}\times\frac{k-1}{8}\right)$ where k = 2, 3, 4 or 5 oe seen or for combinations 1 × 1, 1 × 2, 2 × 1 and 2 × 2 identified If 0 scored, **SC1** for answer $\frac{25}{81}$
6(a)	–8.25	**1**	
6(b)	Correct smooth curve	**3**	**B2FT** for 6 or 7 points correctly plotted or **B1FT** for 4 or 5 points correctly plotted

Question	Answer	Marks	Partial Marks
6(c)	Strict FT reading y value for *their* max and *their* min	**2**	Dep on positive cubic with max and min **B1dep** for each
6(d)	Line $y = \frac{x}{2} - 1$ drawn	**M2**	**M1** for $y = \frac{x}{2} + k$ drawn or $y = px - 1$ drawn ($p \neq 0$) or for $[y =]\frac{x}{2} - 1$ oe soi
	–2.6 to –2.3 0.2 to 0.4 2.3 to 2.7	**A2**	**A2 dep on M2** **A1** for two correct dep on at least M1 earned After **M0**, **SC1** for all 3 correct
7(a)	$\frac{9}{4}$ oe	**2**	**M1** for $4x = 16 - 7$ or $x + \frac{7}{4} = \frac{16}{4}$
7(b)	–2	**2**	**M1** for $4 - y = 6$ or $20 - 5y = 30$
7(c)	–1, 0, 1, 2 final answer	**2**	**B1** for three out of four correct with no extras or four correct with one extra
7(d)	$\frac{4y}{3y+1}$ final answer	**3**	**M1** for elimination of fraction **M1** for isolation of terms in x, FT *their* first step **M1** for factorising and completing to $x =$, FT *their* second step Maximum 2 marks if final answer not correct
7(e)	$\frac{3(2x+y)}{x+4}$ or $\frac{6x+3y}{x+4}$ final answer	**4**	**B1** for $3(2x + y)(2x - y)$ or $(6x + 3y)(2x - y)$ or $(6x - 3y)(2x + y)$ seen **B2** for $(2x - y)(x + 4)$ seen or **B1** for one correct partial factorisation seen If 0 scored, **SC1** for $3(4x^2 - y^2)$ seen
8(a)	*DAE* *ADE* corresponding angles *AED* corresponding angles	**3**	**B1** for three correct angles in correct order **B1** for line 2 correct **B1** for line 3 correct

Question	Answer	Marks	Partial Marks
8(b)	$\frac{AD}{AD+2.7}=\frac{5.6}{9.8}$ or $\frac{AE}{AE+3.9}=\frac{5.6}{9.8}$ oe OR $\frac{5.6}{9.8-5.6}=\frac{AD}{2.7}$ or $\frac{5.6}{9.8-5.6}=\frac{AE}{3.9}$ oe OR equivalent correct calculation	**M2**	**M1** for $\frac{5.6}{9.8}$ oe or $\frac{9.8}{5.6}$ oe isw
	Correct elimination of fraction and rearrangement leading to $AD = 3.6$ and $AE = 5.2$	**A2**	with no errors seen leading to answers **A1** for correct elimination of fraction and rearrangement leading to $AD = 3.6$ **or** $AE = 5.2$ with no errors seen leading to answer
8(c)	76.7 or 76.65 to 76.66	**3**	**M2** for $\cos[\ ]=\frac{3.6^2+5.2^2-5.6^2}{2\times3.6\times5.2}$ oe or **M1** for $5.6^2=3.6^2+5.2^2-2\times3.6\times5.2\cos[\ ]$ oe
8(d)	27.9 or 27.87 to 27.90	**2**	**M1** for $\frac{1}{2}(3.6+2.7)(5.2+3.9)\sin(their\,76.7)$ oe If 0 scored, **SC1** for answer 9.11 or 9.107 to 9.109
9(a)	3.41 or 3.411 to 3.412	**5**	**B2** for $\angle DOC = 72°$ soi or $\angle OED = 18$ soi or **B1** for $\angle ODC = 54°$ soi or $\angle ODE = 90°$ soi or for reflex $\angle AOC = 252$ **M2** for $[r=]\frac{10.5}{\tan(their\,72)}$ oe or **M1** for $\tan(their\,72)=\frac{10.5}{r}$ oe

Question	Answer	Marks	Partial Marks
9(b)	63.1 or 63.10 to 63.13	**5**	**M2** for $[r =]\frac{360\times 7.3}{2\pi\times 82}$ oe or **M1** for $\frac{82}{360}\times 2\pi r = 7.3$ oe **M2** for $\frac{(360-82)}{360}\pi\times(their\ 5.10)^2$ oe or **M1** for $\frac{(360-82)}{360}\pi\times(their\ 5.10)^2$ seen or for $\frac{82}{360}\pi\times(their\ 5.10)^2$ oe isw If 0 scored, **SC1** for $\frac{(360-82)}{360}\times k\pi$ oe
10(a)	$\frac{900}{x}$	**1**	

Question	Answer	Marks	Partial Marks
10(b)	$\frac{900}{x+40}$ oe	**B1**	
	$\frac{900}{x}-\frac{900}{x+40}=0.75$ oe	**M1**	**FT** *their* expressions with different algebraic denominators
	$900(x+40)-900x=0.75x(x+40)$ or $\frac{900(x+40)-900x}{x(x+40)}=\frac{0.75x(x+40)}{x(x+40)}$	**M1**	**FT** elimination of fractions with different algebraic denominators or use of common denominator
	Correct expansion of brackets and rearrangement to $x^2+40x-48000=0$	**A1**	**A0** if any errors or omissions
10(c)	$(x-200)(x+240)$ OR using formula $\frac{-40\pm\sqrt{40^2-4\times1\times-48000}}{2}$ oe OR complete the square $x + 20 = \pm 220$ or $\frac{-40}{2}\pm\sqrt{\left(\frac{40}{2}\right)^2-(-48000)}$ oe	**B2**	**B1** for brackets giving two out of three terms correct or for partial factors $x(x-200) + 240(x-200)$ or $x(x + 240) – 200(x + 240)$ OR $\sqrt{40^2-4\times1\times-48000}$ oe or $\frac{-40\pm\sqrt{their193600}}{2}$ OR for $(x + 20)^2$
	200 and –240	**B1**	
10(d)	4.92	**2**	**M1** for 1.5 × *their* 200 + 0.8 × (*their* 200 + 40) or better