

Cambridge IGCSE™

CAMBRIDGE INTERNATIONAL MATHEMATICS**0607/62**

Paper 6 (Extended)

October/November 2024

MARK SCHEME

Maximum Mark: 60

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.

This document consists of **10** 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 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

- awrt answers which round to
- cao correct answer only
- dep dependent
- FT follow through after error
- isw ignore subsequent working
- nfww not from wrong working
- oe or equivalent
- rot rounded or truncated
- SC Special Case
- soi seen or implied

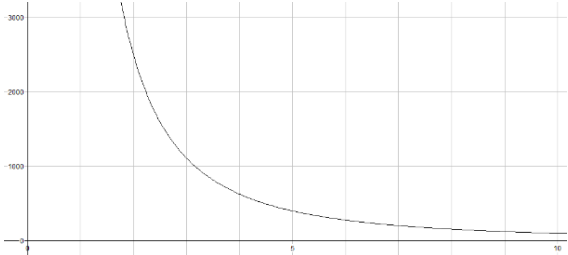
Question	Answer							Marks	Partial Marks
1(a)	12	13	14	15	16	17	18	2	B1 for 4 correct
	21	31	41	51	61	71	81		
	9	18	27	36	45	54	63		

Question	Answer								Marks	Partial Marks
1(b)	N	RD	N	RD	N	RD	N	RD	2	B1 for 5 rows correct
	10	9	20	18	30	27	40	36		
	11	0	21	9	31	18	41	27		
	12	9	22	0	32	9	42	18		
	13	18	23	9	33	0	43	9		
	14	27	24	18	34	9	44	0		
	15	36	25	27	35	18	45	9		
	16	45	26	36	36	27	46	18		
	17	54	27	45	37	36	47	27		
	18	63	28	54	38	45	48	36		
	19	72	29	63	39	54	49	45		
	One correct subtraction seen or 3 differences of 9 seen or 3 examples of $9 \times$ positive difference									
1(c)	9								1	
1(d)	80								1	
	Three from column 72, 63, 54, 45, 36, 27, 18, 9,0 leading to 9 in bottom row or bottom row [72, 63, 54, 45] 36, 27, 18 or 89 in bottom left cell <u>and</u> $98 - 89 = 9$ or 12, 23, 34, 45, ... or difference in digits is 1								C1	

Question	Answer	Marks	Partial Marks																								
2(a)	<table><tr><td>N</td><td>RD</td><td>N</td><td>RD</td></tr><tr><td>100</td><td>99</td><td>105</td><td>396</td></tr><tr><td>101</td><td>0</td><td>106</td><td>495</td></tr><tr><td>102</td><td>99</td><td>107</td><td>594</td></tr><tr><td>103</td><td>198</td><td>108</td><td>693</td></tr><tr><td>104</td><td>297</td><td>109</td><td>792</td></tr></table>	N	RD	N	RD	100	99	105	396	101	0	106	495	102	99	107	594	103	198	108	693	104	297	109	792	1	
	N	RD	N	RD																							
100	99	105	396																								
101	0	106	495																								
102	99	107	594																								
103	198	108	693																								
104	297	109	792																								
	One correct subtraction seen or 3 differences of 99 seen or 3 examples of $99 \times$ positive difference	C1																									
2(b)	First and third digits are [always] the same oe or [only] second digit changes [which doesn't affect the Reverse Difference] oe	1																									
2(c)	99	1																									
2(d)(i)	$100a + 10b + c - 100c - 10b - a$ or $99a - 99c$	1																									
	$99(a - c)$	1																									
2(d)(ii)	$594 \div 99$ oe or difference [between a and c] = 6 oe or $99c = 99 \times 8 - 594$ or 3 correct trials with $a = 8$	C1	FT <i>their 99</i>																								
	Three correct numbers of the form 8 ... 2	1																									
3(a)	$99(a - c) = 99$ or a correct example resulting in 99	C1	FT <i>their $99(a - c)$</i>																								
	The difference between the first and third digits must be 1 oe	1																									
	The second digit can be any digit	1																									

Question	Answer	Marks	Partial Marks
3(b)	Min $c = 0$, max $a = 9$ so 0 to 9 = 10 [digits] or correct example showing RD of 891 or one of 0×99 or 1×99 , ..., 9×99 or $c - a = 9$ oe	C1	
	0, 99, 198, 297, 396, 495, 594, 693, 792, 891	1	
4(a)	$10\,000a + 1000b + 100c + 10d + e$ or $10\,000e + 1000d + 100c + 10b + a$	C1	
	$9999a + 990b - 990d - 9999e$ isw oe	2	B1 for two terms correct
4(b)(i)	$9999a + 990b - 990d - 9999e = 33\,066$ or one correct trial of $a158e - e851a$ with $a > e$	C1	FT their 4(a)
	$9999a + 990[\times 1] - 990 \times 8 - 9999e$ or a second correct trial of $a158e - e851a$ with $a > e$	C1	FT their 4(a) iff b and d terms
	$9999a - 9999e = 39\,996$ oe or a third correct trial of $a158e - e851a$ with $a > e$ and with result of 33 066	C1	
	$a - e = 4$ oe	1	
4(b)(ii)	41 580 51 581 61 582 71 583 81 584 91 585	2	FT their $a - e$ if single digit integer B1 for five correct with no errors

Question	Answer	Marks	Partial Marks
Modelling			
5(a)	$\frac{560 \times 430 \times 42}{1000 \times 1000 \times 1000}$ oe leading to 0.0101[1...	3	M2 for $\frac{560 \times 430}{1000 \times 1000}$ oe or M1 for figs 560 × figs 430
5(b)	0.202 or 0.2022 to 0.2023 kg	1	
5(c)	Any added quantity – Ink/print or staples/binding	1	
5(d)(i)	0.202 × 950 000	C1	FT their answer to 5(b) If C0 scored SC1 for 0.0101... × 950 000
	192 or 191.9 or 192.1 to 192.2	1	
5(d)(ii)	50 000	1	
	(192 or 191.9 or 192.1 to 192.2) × 5 × 52	C1	FT their 5(d)(i)
6(a)	$M = \frac{260 L W d S C}{1000 \times 1000 \times 1000 \times 1000}$ oe isw	2	FT their 260 in 5(d)(ii) B1 for $M = \frac{260 L W d S C}{1000 \times 1000 \times 1000 \times 1000}$ oe with one error or omission
6(b)	51 000 to 51 200 tonnes	1	If 0 scored SC1 for 70000 to 71900
	Correct substitution $\frac{260 \times 560 \times 430 \times 43 \times 20 \times 950\,000}{1000 \times 1000 \times 1000 \times 1000}$ oe or $50\,000 \times \frac{43}{42}$	C1	FT their 6(a) answer if first method used FT their 5(d)(ii) answer if second method used
7(a)	Circular base/cross section/cylindrical [and] apex/vertex i.e. Radius/diameter narrows as it gets taller oe	1	

Question	Answer	Marks	Partial Marks
7(b)	0.21 or 0.105 seen or correct change to m^3 at some stage	1	
	$\frac{\pi \times (\text{figs}105)^2 \times \text{figs}14}{3}$	1	
	$\frac{\pi \times (\text{figs}105)^2 \times \text{figs}14}{3} \times \text{figs}530$ or $\frac{1000}{530} \div \frac{\pi \times (\text{figs}105)^2 \times \text{figs}14}{3}$	1	
	11.67... leading to 12	2	B1 for 85.7 or 85.6 to 85.86 or B1 for 11.67...
8	$N = \left(\frac{100}{D}\right)^2$ oe isw	2	B1 for $\left(\frac{100}{D}\right)^2$
	Diagram with at least one vertical D or one more horizontal D shown or $N = \frac{\text{area of square}}{\text{area for 1 tree}}$ oe or 1 row = $100 \div D$	C1	
9(a)	Correct sketch 	2	Correct shape and B1 for passing through approx. (10, 100) and B1 for passing through approx. (1.8, 3000)

Question	Answer	Marks	Partial Marks
9(b)	If model is $N = \left(\frac{100}{D}\right)^2$ then No oe and 4.02 or No oe and 567 OR If model is $N = \left(\frac{100}{D} + 1\right)^2$ then No oe and 4.18 or Yes oe and 4.18 rounds to 4 or No oe and 615[.5...] or 616 or Yes oe and 615 rounds to 620	1	
	Horizontal line on graph at approx. $N = 620$ or Vertical line at $D = 4.2$	C1	
10	$\frac{51200 \times 12}{620}$ or $\frac{51200}{\frac{620}{12}}$	C2	FT <i>their</i> 51 200 in 6(b) C1 FT for $\frac{\text{their } \mathbf{6(b)}}{620}$ or <i>their</i> 6(b) $\times 12$ or for $\frac{620}{12}$
	990 or 9 900 000	1	
	990 [lots of] 100 m by 100 m squares or hectares or 9 900 000 m ²	C1	FT <i>their</i> 990 or FT <i>their</i> 9 900 000