Cambridge IGCSE™

CAMBRIDGE INTERNATIONAL MATHEMATICS	**0607/62**
Paper 6 (Extended)	**May/June 2022**
MARK SCHEME	
Maximum Mark: 60	

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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 descriptors 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.

Maths-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, 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 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

Opposite Corners

Question	Answer	Marks	Partial Marks
1	16 · · · · · · · · · · 40 88 · · · · · · · · · · 40 170 172 · · · · · · · 40	2	**B1** for two from 16, 88, 170 and 172 **B1** for 40 seen three times
	One set of calculations for the opposite difference for the second or third grid	C1	86×68 – 66×*their*88 or *their*170×152 – 150×*their*172
2(a)	42 46	1	
2(b)	*their*42 × 6 = *their*252 2 × *their*46 = *their*92 *their* 252 – *their* 92	1	
2(c)	8 48 · · · · · · · · · · 160 14 50 · · · · · · · · · · 160 134 138 178 · · · · · · · · · 160	2	**B1** for four from 8, 48, 14, 50, 134, 138 and 178 **B1** for 160 seen three times
	Complete set of calculations for a difference	C1	44 × *their*8 – 4 × *their*48 or *their*50 × *their*14 −10 × 54 or 174 × *their*138 – *their*134 × *their*178
3(a)	 	3	**B1** for each row or **B1** for the 3 cells in the working columns

Size of window	Working		Difference
2 by 2	$(2 - 1)^2$	= 1	40
3 by 3	$(3 - 1)^2$	= 4	160
4 by 4	$(4 - 1)^2$	= 9	360
5 by 5	$(5 - 1)^2$	= 16	640
w by w	$(w - 1)^2$ isw		$40(w - 1)^2$ isw

A correct calculation for a 4 by 4 or 5 by 5 window		C1	

Question	Answer	Marks	Partial Marks
3(b)	$40 \times (10 - 1)^2$ or 40×9^2 or correct calculation from grid	**C1**	**FT** substitution of 10 in *their* $40(w - 1)^2$
	3240	**1**	
4(a)	$n + 14$ $n + 16$	**2**	**B1** for each
4(b)	$(n + 14) \times (n + 2) = n^2 + 16n + 28$	**M1**	**FT** *their* $(n + 14)$ if binomial
	$n^2 + 16n + 28 - n^2 - 16n = 28$	**M1**	
5	n $n + 2$ $n + 2g$ $n + 2g + 2$ oe	**C2**	**C1** for each
	$(n + 2g)(n + 2) = n^2 + 2ng + 2n + 4g$	**C1**	**FT** *their* $(n + 2g)$ and *their* $(n + 2)$ if at least binomials include n and g
	$[-] \, n(n + 2g + 2)$ and $- n^2 - 2ng - 2n$ giving 4g final answer	**1**	
	5 Alternative method		
	2 4 $2 + 2g$ $2 + 2g + 2$ oe	**C2**	**C1** for correct expression in 2nd row
	$4(2 + 2g) = 8 + 8g$	**C1**	**FT** *their* even number in first cell and *their* expression in g
	$-2(4 + 2g) = -8 - 4g$ giving 4g as final answer	**1**	**FT** *their* even number in first cell leading to 4g
6(a)	$n + 2x$ $n + 2gx$ oe $n + 2gx + 2x$ oe	**2**	**B1** for any two correct
	$(n + 2x)(n + 2gx) = n^2 + 2nx + 2ngx + 4gx^2$	**1**	**FT** *their* $(n + 2x)$ and *their* $(n + 2gx)$ if at least binomials include n, g and x.
	$[-] \, n(n + 2gx + 2x)$ and $- n^2 - 2ngx - 2nx$ leading to $4gx^2$	**1**	

Question	Answer	Marks	Partial Marks
6(b)	$gx^2 = 36$ or $g = \dfrac{36}{x^2}$ or $x = \dfrac{6}{\sqrt{g}}$ or for substituting for g or x in $4gx^2 = 144$	**C1**	
	2 by 2 window on a grid of width 36 3 by 3 window on a grid of width 9 4 by 4 window on a grid of width 4	**3**	**B2** for $x = 1$ and $g = 36$ and $\qquad\qquad x = 2$ and $g = 9$ and $\qquad\qquad x = 3$ and $g = 4$ soi or **B1** for one of the above soi
7(a)	[Temperature] 20.4[4…] [Number of chirps] 132[.33…]	**2**	**B1** for each
7(b)	4 points correctly plotted	**2**	**B1** for 3 points correctly plotted
7(c)	$N = 9.72T - 66.4$	**2**	**B1** for $9.72T - 66.4$ or $N = 9.72T - k$ or $N = k\,T - 66.4$ or $N = 9.7T - 66$
7(d)	Correct ruled straight line through *their* mean point	**2**	**B1** for ruled straight line through *their* mean point with positive gradient or **B1** for ruled straight line, not through *their* mean point, within tolerance.
7(e)	Line $N = 170$ drawn or substitution $N = 170$ in *their* model	**C1**	
	24 to 25	**1**	

Question	Answer	Marks	Partial Marks
7(f)(i)	One calculation to convert temperature e.g. $1.8 \times 19 + 32$ and correct calculation for finding N e.g. $106 \times \dfrac{13}{60}$ oe	**C2**	**C1** for a calculation to convert temperature e.g. $1.8 \times 19 + 32$ or correct calculation for finding N e.g. 106 oe
	Temperature C to F 	19	66
21	70
22	72	 **Number of chirps** 	106	23
129	28
138	30		**2**	**B1** for three correct values
7(f)(ii)	Yes: The temperatures are around 40 more oe	**1**	Expect good fit oe as reason

Question	Answer	Marks	Partial Marks
8(a)	$88 = 0.5 \times 16^2 + 16a + b$	**C1**	
	$208 = 0.5 \times 27^2 + 27a + b$	**C1**	
	Correct isolation of variable(s) and correct subtraction or correct substitution and $11a = -116.5$ or $-11a = 116.5$ or $22a = -233$ or $-22a = 233$ OR Correct isolation of b in both equations and sketch of intersecting straight lines	**C2**	**FT** *their* equations if the same form. **C1** for one of the first two. OR **C1** for either
	$[a =] -11$ $[b =] 129$	**B1**	
8(b)	Correct sketch 	**2**	**B1** for correct shape **B1 dependent** for passing through (16, 88) and (27, 208) within tolerance
8(c)	Good fit oe	**1**	
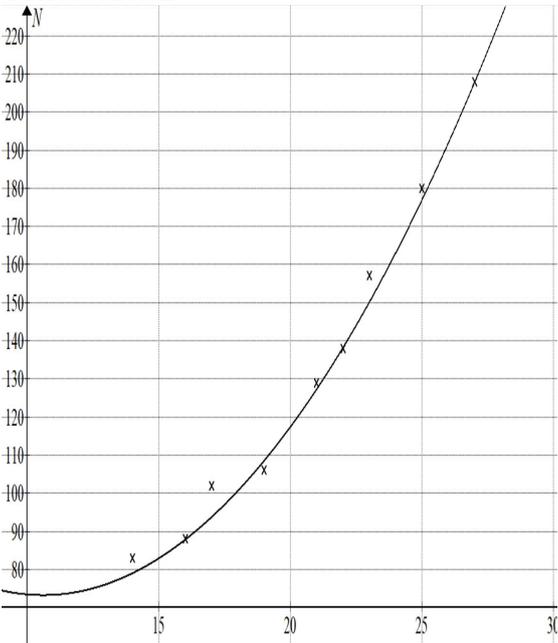
Question	Answer	Marks	Partial Marks
9(a)(i)	[gradient or m] $\dfrac{3.5-2.35}{21-17.5}$ or $2.35 = 17.5m + c$ and $3.5 = 21m + c$ and 0.329 or 0.3285 to 0.3286 or 0.33 or $\dfrac{23}{70}$ or $\dfrac{1.15}{3.5}$ or $1.15 = 3.5m$ oe	C2	**C1** for [gradient or m] $\dfrac{3.5-2.35}{21-17.5}$ or $2.35 = 17.5m + c$ and $3.5 = 21m + c$
	(17.5, 2.35) or (21, 3.5) correctly substituted in $A = (their$ gradient$)T + c$	C1	**FT** *their* gradient
	$A = 0.329T - 3.4$	B1	
9(a)(ii)	$N = 19.7T - 204$ or $N = 60\,(0.329T - 3.4)$ oe isw	1	**FT** *their* model in **(a)(i)**
9(b)	Two correct statements from: African cricket has a smaller range of temperatures oe African cricket starts chirping at a higher temperature oe African cricket stops chirping at a higher temperature oe African cricket has a smaller range of chirps/second oe African cricket has greater number of chirps per minute oe African cricket has greater rate of increase of chirps oe The increase in the rate of increase of chirps of the Snowy Tree cricket is more than the increase in the rate of increase of chirps of the African cricket. oe African cricket number of chirps are more varied oe	2	**B1** for one statement