

## **Cambridge Assessment International Education**

Cambridge International General Certificate of Secondary Education

#### **CAMBRIDGE INTERNATIONAL MATHEMATICS**

0607/62

Paper 6 (Extended) May/June 2018

MARK SCHEME
Maximum Mark: 40

#### **Published**

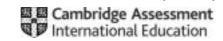
This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, 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.

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## Cambridge IGCSE – Mark Scheme PUBLISHED

## **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.

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## 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

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Question	Answer			Marks	Partial Marks
A	INVESTIGATION TILE PATT			ΓERNS	
1(a)	Correct border			1	
1(b)	Correct border			1	
2(a)	Pattern Number of Total finishes white tiles in number of with border white tiles			2	B1 for any 2 correct
	1st white border	8	8		
	2nd white border	24	32		
	3rd white border	40	72		
	4th white border	56	128		
	5th white border	72	200		
2(b)	$8n^2$ oe			2	M1 for <i>their</i> three correct <b>second</b> differences
					or <b>B1</b> for recognising factor of 8 in the total number of white tiles.
2(c)(i)	7 11			2	<b>B1</b> for 7 and 11 or for 4 <i>n</i> –1
	4n-1 oe				C opportunity
2(c)(ii)	$(4n-1)^2$ oe isw			1	<b>FT</b> <i>their</i> (4 <i>n</i> –1)
2(d)	their $(4n-1)^2$ – their $8n^2$			M1	$16n^2 - 8n + 1$ may be seen in <b>4(c)(ii)</b>
	$16n^2 - 8n + 1 - 8n^2$			A1	answer given
3(a)	[number of white tiles =] 200 [number of grey tiles =] 161			4	<b>B1</b> for 19 or 361
	[number o	r grey tiles =]	161		<b>B1</b> for $n = 5$ seen or substituted in their $8n^2$ or $8n^2 - 8n + 1$ or <b>B1</b> for at least 4 terms of sequence 1 17 49 97 161 <b>B1</b> for each correct answer
					C opportunity

# Cambridge IGCSE – Mark Scheme **PUBLISHED**

Question	Answer	Marks	Partial Marks	
3(b)	(largest side length possible =) 8.7 or 870 (number of white tiles not used =) 108 (number of grey tiles not used =) 51	4	M1 for [white] $their 8n^2 = 500$ or $their (4n-1)^2 = 1000$ or $961$ or $729$ or $n = 7$ or $8$ soi or $8$ 32 72 128 200 288 or $8 + 24 + 40 + 56 + 72 + 88[+]$ or for [grey] $8n^2 - 8n + 1 = 500$ or $(4n-3)^2 = 1000$ or $961$ or $1$ 17 49 97 161 241 or $1 + 16 + 32 + 48 + 64 + 80[+]$ B1 for each correct answer If 0 or 1 scored, replace with SC2 for 29 soi or 392 or 449 or 841 seen.	
Communication: Seen in three of the following questions		1		
2(c)(i)	Two differences of 4 seen or difference = 4 corner tiles shown			
3(a)	$\frac{570}{30}$ or $\frac{5.7}{0.3}$ or $\frac{570 \times 570}{30 \times 30}$ or $\frac{324900}{900}$ oe			
3(a)	further correct working to find second number of tiles			
3(b)	Correct units on answer line for length of side after working with 30 or 0.3 seen.			
3(b)	annotation of working at least twice, e.g. 29 'grey tiles'			

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Question	Answer	Marks	Partial Marks			
В	MODELLING GOING WITH THE FLOW					
4(a)(i)	a + b + 12 = 21 oe isw 4a + 2b + 12 = 24 oe isw	2	B1 for each equation  If 0 scored, then SC1 for $[v = ]a + b + 12 \text{ and } [v = ]4a + 2b + 12$			
4(a)(ii)	$v = -3 x^2 + 12 x + 12$	2	FT their linear equations, each with a and b terms, leading to $a \neq 0$ .  B1 for one correct.  or M1 for correctly eliminating one variable.			
4(b)(i)	Smooth curve drawn through at least 9 correct points.	2	<b>B1</b> for 9 or 10 correct points plotted			
4(b)(ii)	1 < x < 2 oe	1				
5(a)	24[.0]	1	C opportunity			
5(b)(i)	$[\log v = ] m \log \left(\frac{x}{2}\right) + \log their 24$	2	Strict FT from their 5(a) B1 for each			
			C opportunity			
5(b)(ii)	$[m =] 0.2 \text{ or } \frac{1}{5}$ $v = their k \left(\frac{x}{2}\right)^{their m}$	1				
5(c)	0.06[25] oe or 6[.25] cm	2	M1 for $12 = their \ 24 \left(\frac{x}{2}\right)^{their \ 0.2}$ or better  A1FT for $m \ne 1$ leading to $0 < x < 2$ C opportunity			
6(a)	[Distance = $(2-x)m = $ ] $100(2-x) cm$ or [Speed = ] $\frac{u}{100}$ m/s	В1				
	$Time = \frac{distance}{speed} oe$	B1				
6(b)	$\frac{20 \times 100}{24 \left(\frac{x}{2}\right)^{0.2}} \text{ or better isw}$	1	FT their v from 5(b)(ii)			

Question	Answer	Marks	Partial Marks		
6(c)	$\frac{100(2-x)}{u} \leqslant \frac{20 \times 100}{24 \left(\frac{x}{2}\right)^{0.2}} \text{ or}$ better isw	1	answer given		
6(d)(i)	Correct sketch  u  0  2	1	C opportunity		
6(d)(ii)	1.397 to 1.4	1	C opportunity		
Communication: Seen in two of the following questions		1			
5(a)	$[k](1)^m$				
5(b)(i)	$\log v = \log \left(\frac{x}{2}\right)^m + \log k$				
5(c)	Correct units (normally metres)				
6(d)(i)	scale for u				