Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/61**

Paper 6 (Extended) **October/November 2016**

MARK SCHEME

Maximum Mark: 40

Published

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

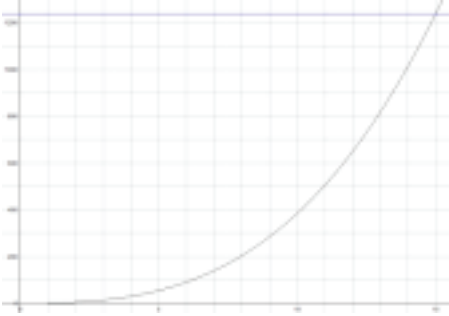Cambridge will not enter into discussions about these mark schemes.

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Abbreviations

awrt	answers which round to
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

A	INVESTIGATION	SQUARES ON GRIDS		
Question	**Answer**		**Mark**	**Part Marks**
1 (a)	4 small and 1 large oe		1	
(b)	9 4 1 14		1	
(c)	16 9 4 1 30		1	If 0 scored in parts (b) and (c), **SC1** for 1, 4, 9, 16 (i.e. reverse order)
2 (a)	Size Total 1 by 1 1 **1** 2 by 2 **4** **1** 5 3 by 3 **9** 4 **1** 14 4 by 4 **16** **9** **4** **1** 30 5 by 5 **25** **16** **9** **4** **1** **55** 6 by 6 **36** **25** **16** **9** **4** **1** **91**		2	**B1** for first 4 rows correct **B1** for rows 5 and 6 correct If 0 scored in parts 1(b) and 1(c) or SC in 1(c), **SC1** for first 4 rows correct, in reverse order AND **SC1** for rows 5 and 6 correct, in reverse order
(b)	Square [numbers]		1	
(c)	204		1	C opportunity
(d)	$(n-1)^2$ oe		1	
3 (a)	$d = 0$		1	
	$c = \dfrac{1}{6}$		1	C opportunity

Question	Answer	Mark	Part Marks
(b)	$T = \dfrac{1}{3}10^3 + \dfrac{1}{2}10^2 + \dfrac{1}{6}10$ leading to 385	1	
(c)	15	1	C opportunity
4	n	1	
5 **(a)**	11	1	
(b)	2 by 1 2 0 2 2 by 2 4 1 5 2 by 3 6 2 8 2 by 4 8 3 11 2 by 5 10 4 14 2 by n $2n$ $n-1$ $3n-1$ oe	1 1	
6	3 by 1 3 0 0 3 3 by 2 6 2 0 8 3 by 3 9 4 1 14 3 by 4 12 6 2 20 3 by 5 15 8 3 26 3 by n $3n$ $2n-2$ $n-2$ $6n-4$ oe	2	**B1** for rows 4 or 5 correct **B1 FT** for *their* linear expressions in columns 3, 4 and 5
7	$[n] < 3$ oe	1	C opportunity
Communication: Seen in two of the following questions		1	
2 **(c)**	For showing 91 + 49 + 64 or 1 + 4 + 9 + 16 + 25 + 36 + 49 + 64 or in tabular form		
3 **(a)**	For showing working of a correct method		
3 **(c)**	For showing working or sketch 		
7	For < 2 in 2 by something and < 3 in 3 by something oe		

B   **MODELLING**   **MEASURING ROD**

Question			Answer	Mark	Part Marks
1	**(a)**		Cylinder	1	
	(b)		$152.7\ldots$ cm oe	2	**M1** for $\dfrac{1200}{\pi \times 0.5^2}$ oe
2	**(a)**		Must be able to hold it oe	1	
	(b)	**(i)**	50	1	
		(ii)	Cross-section narrows oe	1	
3	**(a)**		$\dfrac{1}{2} \times 50 \times 50 \times \sin x$	1	
	(b)		$\dfrac{x}{360} \times \pi \times 50^2$	1	
			$21.81x$ to $21.82x$	1	
	(c)		$21.8x - 1250\sin x$ isw	1	
	(d)		*their* 3(c) $\times$ 153	1	**FT** *their* 3(c)
	(e)		Correct curve	2	**B1** for correct shape **B1** for passing through approximately $(80, 79\,000)$ and approximately $(150, 406\,000)$
	(f)	**(i)**	132 to 132.2	1	C opportunity
		(ii)	29.6 to 29.75	2	**FT** *their* f(i) in $\cos\left(\dfrac{\text{f(i)}}{2}\right)$ **FT M1** for $50 \times \cos\left(\text{\textit{their}}\dfrac{132}{2}\right)$ oe C opportunity
	(g)		70.2 to 70.3	1	**FT** $100 - \textit{their}$ (f(ii))
4			13.7 or 13.74 to 13.75	2	**M1** for $\cos\left(\dfrac{\textit{their}\,87.05}{2}\right) \times 50$ implied by 36.2 to 36.3 C opportunity

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Question	Answer	Mark	Part Marks
Communication: Seen in one of the following questions		**1**	
3 **(f)** **(i)**	seen in 3(e) For line on graph (sketch) at V = 300000		
3 **(f)** **(ii)**	For working shown i.e. extra stage like division by 2 or cos *their* angle		
4	seen in 3(e) For line on graph (sketch) at V = 100000 or *x* = 87.0[5]		