CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0607 CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/61 Paper 6 (Extended), maximum raw mark 40

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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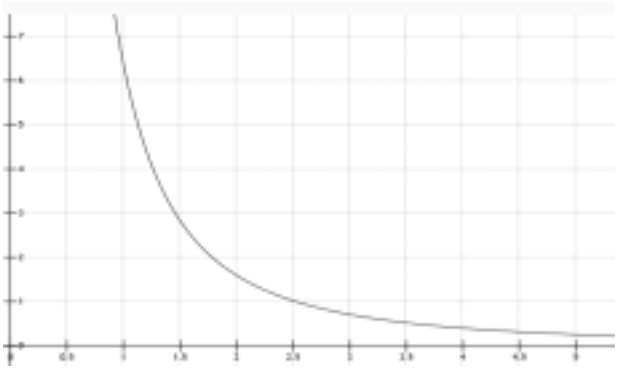
A	**INVESTIGATION CUBES**			
1	**(a)**	8	**1**	
	(b)	Response implying some faces hidden within the large cube	**1**	bod 'can't see'
	(c)	24	**1FT**	3 × *their* **(a)**
2	**(a)**	27	**1**	
	(b)	8	**1**	
	(c)	6	**1**	
3		<table><tr><th rowspan="2">Size of cube</th><th rowspan="2">Total number of small cubes</th><th colspan="4">Number of small cubes with</th></tr><tr><th>0 crosses</th><th>1 cross</th><th>2 crosses</th><th>3 crosses</th></tr><tr><td>2 by 2 by 2</td><td>8</td><td>0</td><td>0</td><td>0</td><td>8</td></tr><tr><td>3 by 3 by 3</td><td>27</td><td>1</td><td>6</td><td>12</td><td>8</td></tr><tr><td>4 by 4 by 4</td><td>64</td><td>8</td><td>24</td><td>24</td><td>8</td></tr><tr><td>5 by 5 by 5</td><td>125</td><td>27</td><td>54</td><td>36</td><td>8</td></tr></table>	**2**	**B1** for 125 and 36 or **B1** for first 3 rows correct
4	**(a)**	1 small cube with 0 crosses gives 0 crosses **6** small cubes with 1 cross gives 6 crosses 12 small cubes with 2 crosses gives **24** crosses **8** small cubes with 3 crosses gives **24** crosses Total = **54** crosses	**1**	
	(b)	9 54	**1**	
	(c)	96	**1**	**C** opportunity
	(d)	$6n^2$ oe	**1**	**C** opportunity
5		$(n-2)^3$ oe isw	**2**	**B1** for $[kn]-2$ for n^3 soi **C** opportunity
6		Yes oe and $n = 8$ oe or 216 seen	**1**	**SC1** for $n = 2$ and cubes = 8 with working shown e.g. sketch

7		$12(n-2)$ oe	**1**	**C** opportunity
8	**(a)**	216	**1**	**C** opportunity
	(b)	150	**2**	**B1** for $n = 7$ soi If 0 scored **SC1 FT** *their* **7** = 60 followed by *their n* in $6(n-2)^2$ n must be integer **C** opportunity
		Communication seen in at least two of **4(c)**, **4(d)**, **5**, **7**, **8(a)** or **8(b)**	**1**	

B	MODELLING	FISH PONDS		
1	(a)	$\frac{1}{2}\times\frac{4}{3}\times\pi\times3^3$ oe	1	seen through working
	(b)	$\pi\times d^2\times d$	1	
	(c)	[cylinder =] 27π [and] [hemisphere =] 18π oe	1	accept $[H=]\frac{2}{3}\pi r^3$ and $[C=]\pi r^3$
	(d)	$\frac{2}{3}\pi r^3 = \pi d^3$	1	
2	(a)	13.5 [m^3]	3	**M2** for $\frac{15\times18\times5}{0.1}$ oe or **M1** $\frac{15\times18}{0.1}$ or better soi by 2700 or $\frac{20\times5}{0.1}$ or better **C** opportunity
	(b)	$W = 0.05FL$ oe	1	
	(c) (i)	16 [fish]	2FT	**B1** for 16.6[…] or **FT** *their* 16.6[…] **C** opportunity
	(ii)	2.1… to 2.19	1	**C** opportunity
	(iii)	1.85[…] [m] or 1.86[m]	1	Accept cube root of $\frac{20}{\pi}$ If 0 scored in **(i)** and in **(ii)** **SC1** for same converting error in both **C** opportunity

3	**(a)**	$d = \frac{20}{\pi r^2}$ oe	**1**	
	(b)		**2**	**1** for shape **1** for not reaching either axis between $y = 7$ and $x = 5$
	(c)	Too deep oe	**1**	
	(d)	2.52[m] 2.522 to 2.523…	**1**	**C** opportunity
4	**(a)**	$d = \frac{20}{\pi r^2} + 0.3$	**1FT**	**FT** *their* **3(a)** + 0.3
	(b)	Translates [up by] 0.3 oe	**1FT**	**FT** *their* + 0.3
		Communication seen in two or more of **2(a)**, **2(c)(i)**, **2(c)(ii)**, **2(c)(iii)** or **3(d)**	**1**	