Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CAMBRIDGE INTERNATIONAL MATHEMATICS **0607/63**

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

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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Abbreviations

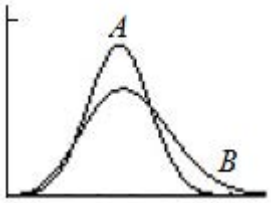
awrt answers which round to
cao correct answer only
dep dependent
FT follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
nfww not from wrong working
soi seen or implied

A INVESTIGATION TRIANGULAR GRIDS

<table>
<tr><th colspan="2">Question</th><th>Answer</th><th>Marks</th><th>Part Marks</th></tr>
<tr><td>1</td><td>(a)</td><td>10</td><td>1</td><td></td></tr>
<tr><td></td><td>(b)</td><td>36</td><td>1</td><td></td></tr>
<tr><td></td><td>(c)</td><td>[A =] $2rs$ oe</td><td>1</td><td></td></tr>
<tr><td></td><td>(d)</td><td>16</td><td>1</td><td></td></tr>
<tr><td></td><td>(e)</td><td>[A=] x^2</td><td>1</td><td></td></tr>
<tr><td></td><td>(f)</td><td>Diagram (+ area stated)+ reference to $A = x^2$</td><td>1</td><td></td></tr>
<tr><td>2</td><td>(a)</td><td>
<table>
<tr><th>Shape</th><th>Dots inside shape (R)</th><th>Dots on perimeter (P)</th><th>Area in triangles (A)</th></tr>
<tr><td>B</td><td>0</td><td>6</td><td>4</td></tr>
<tr><td>C</td><td>0</td><td>5</td><td>3</td></tr>
<tr><td>D</td><td>0</td><td>7</td><td>5</td></tr>
<tr><td>E</td><td>0</td><td>9</td><td>7</td></tr>
<tr><td>F</td><td>0</td><td>4</td><td>2</td></tr>
</table>
</td><td>2</td><td>B1 for 5 or 6 cells correct</td></tr>
<tr><td></td><td>(b)</td><td>No, supported by one correct calculated substitution</td><td>2</td><td>B1 for clear attempt to substitute figures from the table into Pick’s rule</td></tr>
<tr><td></td><td>(c)</td><td>$A = P - 2$ oe isw</td><td>1</td><td></td></tr>
<tr><td></td><td>(d)</td><td>$A = P + 2R - 2$ oe</td><td>2</td><td>B1 for $A = P + 2R + k$
or $A = P + kR - 2$ ($k \neq 0$)</td></tr>
<tr><td></td><td>(e)</td><td>R and P which satisfy their formula</td><td>1</td><td>Dependent on B1 in part (d)</td></tr>
</table>

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Question	Answer	Marks	Part Marks
3 (a)	True oe and drawing of regular hexagon	**1**	
(b)	True oe and two points plotted to show statement is true.	**1**	C opportunity
(c)	False oe and two points plotted to show statement is false	**1**	C opportunity
(d)	True oe Two points plotted to show statement is true.	**1** **1**	C opportunity
Communication: Seen in one of the following questions		**1**	
3 (b)	Co-ordinates shown		
3 (c)	Co-ordinates shown		
3 (d)	Co-ordinates shown		

B	**MODELLING**	**MODELLING WAVES**	
Question	**Answer**	**Marks**	**Part Marks**
1 (a)	2.918 to 2.919	**1**	C opportunity
(b) (i)	Relevant comparison between 5.836 to 5.84 (2H) and 5.20	**1**	
(ii)	Mean of 6 highest waves = 3.855 to 3.86 Relevant comparison with $1.27 \times 2.92 = 3.708$ to 3.71	**2**	**B1** for each C opportunity
2 (a)	 Correctly shaped and labelled sketches	**2**	**B1** for each If zero scored **SC1** for correct sketch but no, or incorrect, labels
(b)	1.8	**1**	
(c)	1.86 to 1.862 ...	**1**	If 0 scored in (b) **SC1** for correct answers switched between (b) and (c)
(d)	B and two valid reasons	**2**	**B1** for B and one valid reason,

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Question	Answer	Marks	Part Marks
3 (a) (i)	$s = 3.2$	1	
(ii)	Speed doesn't change with height	1	
(b) (i)	$s = a\sqrt{d} + c$	1	
(ii)	$a = 2.99$ to 3.24 $c = -0.1$ to 0.11	2	**B1** for each, dependent on correct (b)(i) If zero scored **SC1** for correct substitution into *their* model twice. C opportunity
(c)	1.75 to 2.15	4	**B1** for 170 [m] **B1** for $s = 4.25$ to 4.5 or **B1 FT** $\frac{\textit{their}170}{\textit{their}40}$ equated **M1** for substituting *their a*, *c*, and *s* into *their* model
Communication: Seen in two of the following questions		1	
1 (a)	$\frac{1}{3} = 20$		
1 (a)	All numbers added and ÷ *their* 20		
1 (a)	*their* 58.37 ÷ *their* 20		
1 (b) (ii)	10% of 60 = 6		
3 (c)	*their* m converted to cm e.g. 17cm = 170cm		
3 (c)	$\frac{\textit{their}170}{\textit{their}40}$		

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