



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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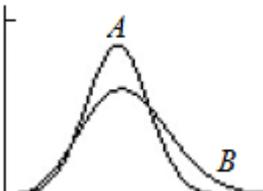
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Abbreviations

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

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)	 <p>Correctly shaped and labelled sketches</p>	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	B1 for each, dependent on correct (b)(i) If zero scored SC1 for correct substitution into <i>their</i> model twice. C opportunity
(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	
(c)	1.75 to 2.15	4	B1 for 170 [m] B1 for $s = 4.25$ to 4.5 or B1 FT $\frac{\text{their}170}{\text{their}40}$ equated M1 for substituting <i>their a, c,</i> and <i>s</i> into <i>their</i> model
Communication: Seen in two of the following questions		1	
1 (a)	$\frac{1}{3} = 20$		
1 (a)	All numbers added and \div <i>their</i> 20		
1 (a)	<i>their</i> 58.37 \div <i>their</i> 20		
1 (b) (ii)	10% of 60 = 6		
3 (c)	<i>their</i> m converted to cm e.g. 17cm = 170cm		
3 (c)	$\frac{\text{their}170}{\text{their}40}$		