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**CAMBRIDGE INTERNATIONAL MATHEMATICS**

**0607/33**

Paper 3 (Core)

**May/June 2016**

MARK SCHEME

Maximum Mark: 96

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**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

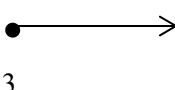
awrt	answers which round to
cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
nfww	not from wrong working
soi	seen or implied

Question	Answer	Mark	Part Marks
<b>1</b> (a)	(7, 2)	<b>1</b>	
	(b) Right-angled <u>or</u> isosceles	<b>1</b>	
	(c) 45	<b>1</b>	
	(d) Straight line from (3, 2) to (5, 4) at least	<b>1</b>	
<b>2</b> (a)	171 000	<b>4</b>	<b>M3</b> for $300 \times (210 + 150 + 210)$ oe or <b>M2</b> for $3 \times (2.1 + 1.5 + 2.1)$ oe soi or <b>M1</b> for $3 \times 2.1$ or $3 \times 1.5$ oe soi
	(b) (i) 190	<b>3</b>	<b>M2</b> for $\frac{300}{30} \times \frac{570}{30}$ oe or <b>B1</b> for $\div 30$ soi
	(ii) 38 pattern tiles 152 plain tiles 16 boxes plain, 4 boxes pattern	<b>2</b> <b>2</b> <b>1FT</b>	<b>M1</b> for <i>their</i> $190 \div 5 (\times 1)$ oe <b>M1</b> for <i>their</i> $190 \div 5 \times 4$ oe
	(c) 9.45	<b>2</b>	<b>M1</b> for $3 \times 2.1 \times 1.5$
<b>3</b> (a)	(i) Green	<b>1</b>	
	(ii) Yellow	<b>1</b>	
	(iii) $\frac{2}{12}$ oe isw	<b>1</b>	
	(iv) 0	<b>1</b>	
	(b) G 1 or 1 R 2 1 O 2 3 Y 5 5	<b>3</b>	<b>B1</b> for $G + R + O + Y = 10$ <b>B1</b> for 5 yellow
<b>4</b> (a)	(i) 290	<b>2</b>	<b>M1</b> for $65 \times 4$
	(ii) 7	<b>2</b>	<b>M1</b> for $(485 - 30) \div 65$ soi
	(b) 24	<b>2</b>	<b>M1</b> for distance $\div$ time soi

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Question	Answer	Mark	Part Marks								
5 (a) (i)	<table style="border-collapse: collapse;"> <tr><td style="border-right: 1px solid black; padding-right: 5px;">13</td><td style="padding-left: 5px;">1 1 4</td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">14</td><td style="padding-left: 5px;">1 2 7 7</td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">15</td><td style="padding-left: 5px;">1 2 2 3 5 9</td></tr> <tr><td style="border-right: 1px solid black; padding-right: 5px;">16</td><td style="padding-left: 5px;">[0] 4</td></tr> </table> <p>e.g. 16   0 represents 16.0 [years]</p>	13	1 1 4	14	1 2 7 7	15	1 2 2 3 5 9	16	[0] 4	2	<b>B1</b> for correct table with 1 or 2 errors or ‘correct’ table but unordered leaves
13	1 1 4										
14	1 2 7 7										
15	1 2 2 3 5 9										
16	[0] 4										
(ii)	3.3	1									
(iii)	15.1	1									
(b)	14.6	2	<b>M1</b> for $7 \div 12$ soi								
6 (a) (i)	1 or 4 or 6	1	If 0 scored <b>SC1</b> for 2, 4, 6, 8, 10, 12, 14 only anywhere in $B$								
(ii)	9	1									
(iii)	15	1									
(iv)	8	1									
(v)	7	1									
(b)	7, 9 in $A$ 6, 8 in $A \cap B$ 2, 10, 14 in $B$	1 1 1									
7 (a)	Correct reflection	1	<b>B1</b> for correct rotation 90 anti-clockwise or for correct orientation, wrong position  <b>B1</b> for either 3 horizontal to right or 2 vertical up  or for correct $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ translation								
(b)	Correct rotation	2									
(c)	Correct translation	2									
(d)	Enlargement [Scale factor] 2	1 1		If more than one transformation, question scores zero.							

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Question	Answer	Mark	Part Marks
8	(a) (i)	8	<b>B1</b> for $12x - 10 = 8$ or $6x - 5 = 4$ <b>B1</b> for $12x = 8 + their 10$ Or for $6x = their 4 + 5$
	(ii)	-4	
	(iii)	$1\frac{1}{2}$ oe	
	(b)	$x = -2$ $y = 5$	
9	(a)	Maths and E:80% M:85% S: 70%	<b>B2</b> for 2 values correct or <b>M1</b> for mark ÷ total implied by 1 value correct
	(b)	81	<b>M2</b> for $60 \times 1.35$ oe or <b>M1</b> for $60 \times 0.35$ oe
10	(a)	Substitute $x = 4$ and $y = 5$ Show this balances	OR Substitute $x = 4$ into equation Show get $y = 5$
	(b)	2	
	(c)	$y = 2x + 1$ oe final answer	<b>B1</b> for $y = 2x + n$ oe $n \neq -3$ or for $y = px + 1$ oe $p \neq 0$ or for $2x + 1$
	(d)	$[x = ] \frac{y+3}{2}$ oe final answer	<b>M1</b> for correct first step <b>M1FT</b> for correct second step
11	(a)	Correct diagram	<b>B1</b> for 0.7 oe correctly placed once
	(b)	0.09 oe	<b>M1</b> for $0.3 \times their 0.3$
12	(a)	$9x$ final answer	<b>B1</b> for $\frac{9x^2}{[1]x}$ or $\frac{18x}{2}$ seen
	(b)	$3x([1]x + 2)$ final answer	<b>B1</b> for $3([1]x^2 + 2x)$ or $x(3x + 6)$
	(c)		
	(d)	5, 6, 7	
	(e)	$x^2 + [1]x - 6$ final answer	<b>B1</b> for any three of $x^2$ , $-2x$ , $(+)3x$ , $-6$ seen
13	(a)	13.8 or 13.82...	<b>M1</b> for $7.2^2 + 11.8^2$ soi
	(b)	37.8 or 37.82...	<b>M1</b> for $\tan [y = ] 11.8 \div 15.2$

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Question	Answer	Mark	Part Marks
14 (a)	Correct shape	1	
	Correct position	1	
(b)	Max $(-2, 20)$	1	
	Min $(1, -7)$	1	
(c)	$(-3.31, 0)$	1	
	$(0, 0)$	1	
	$(1.81, 0)$	1	
			If 0 scored <b>SC1</b> for $-3.3, 0, 1.8$ seen as $x$