

CAMBRIDGE INTERNATIONAL EXAMINATIONS**Cambridge International General Certificate of Secondary Education****MARK SCHEME for the October/November 2015 series****0607 CAMBRIDGE INTERNATIONAL MATHEMATICS****0607/31**

Paper 3 (Core), maximum raw mark 96

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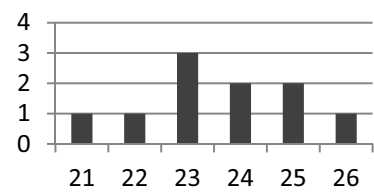
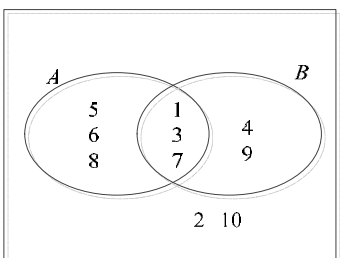
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Abbreviations

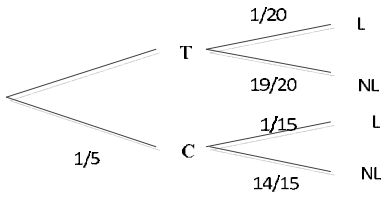
cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
nfww	not from wrong working
soi	seen or implied

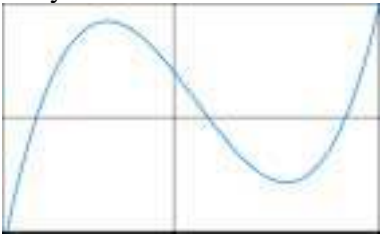
1	(a)	2, 3, 6, 9	1	
	(b) (i)	26	1	
	(ii)	300.763	1	
	(iii)	12.8 or 12.76...	2	B1 for 37.4 seen
	(c) (i)	807.54 cao	1	
	(ii)	807.5 cao	1	
	(iii)	810 cao	1	
	(iv)	800 cao	1	
2		$a = 48$ $b = 44$ $c = 44$ $d = 88$	1 1 1 FT 1 FT	FT <i>their (b)</i> FT $180 - 48 - \text{their } 44$ or $180 - \text{their (a)} + \text{their (b)}$
3	(a)	36	2	M1 for 25 or 4 seen
	(b)	17.8 or 17.77...	3	M2 for $\frac{5300 - 4500}{4500} \times 100$ oe or M1 for $\frac{5300 - 4500}{4500}$ or $\frac{5300}{4500} \times 100$
4	(a) (i)	19.2	1	
	(ii)	18.4	1	
	(b)	0.5 0.4	1 1	If 0 scored SC1 if reversed
	(c)	64 64	1 1	
	(d)	147.2[0]	2 FT	M1 for <i>their</i> $64 \times [0].95$ and <i>their</i> 64×1.35 oe

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5	(a) (i)	5	1	
	(ii)	23	1	
	(iii)	23.5 oe	1	
	(iv)	23.6	1	
	(b)		2	
6	(a)	150	1	B1 for 4 correct bars FT <i>their</i> (a) $\times 2$ M1 for $2 \times 1.45 + [0].7[0]$ or better
	(b)	300	1 FT	
	(c)	[0].65	2	
	(d)	[0].75	1	
7	(a)	$F + 2M$	2	B1 for $2M$ seen M1 for correct substitution in <i>their</i> formula M1 for correct substitution in <i>their</i> formula
	(b)	15	2 FT	
	(c)	9	2 FT	
8	(a)		2	B1 for 2 correct regions FT FT FT 1 1 1
	(b) (i)	1 3 7	1 FT	
	(ii)	2 10	1 FT	
	(iii)	4 9	1 FT	
	(c) (i)	$\frac{5}{10}$ oe	1	
	(ii)	$\frac{3}{10}$ oe	1	
	(iii)	$\frac{4}{10}$ oe	1	

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9	(a)	33 46	1 1	
	(b)	$n^2 - 3$	3	B2 for $n^2 \pm k$ or M1 for finding second differences or any quadratic
10	(a)		3	B1 for each branch
	(b)	$\frac{4}{100}$ oe	2	M1FT for $\frac{4}{5} \times \text{their } \frac{1}{20}$
	(c)	$\frac{71}{75}$ or 0.947 or 0.9466...	3	M2 for $\frac{4}{5} \times \text{their } \frac{19}{20} + \text{their } \left(\frac{1}{5} \times \frac{14}{15} \right)$ or M1 for $\frac{4}{5} \times \text{their } \frac{19}{20}$ or $\text{their } \left(\frac{1}{5} \times \frac{14}{15} \right)$
11	(a)	Vertices at (3, 1) (3, 2) (4, 2) (4, 4) (5, 4) (5, 1)	2	If 0 scored SC1 for reflection in $y = 1$ or $x = 0$
	(b)	Vertices at (-5, -2) (-3, -1) (-4, -1) (-4, 1) (-5, -1) (-3, -2)	2	If 0 scored SC1 for translation of $\begin{pmatrix} -2 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -3 \end{pmatrix}$ or $\begin{pmatrix} -3 \\ -2 \end{pmatrix}$
	(c)	Vertices at (1, -1) (1, -2) (2, -2) (3, -1) (2, -4) (3, -4)	2	If 0 scored SC1 for any rotation about (0, 0) or a rotation of 180°
12	(a)	Points plotted correctly	2	B1 for each point
	(b)	(5, 0)	2	B1 for each co-ordinate If 0 scored SC1 for (0, 5)
	(c)	8.49	3	M1 for $\sqrt{6^2 + 6^2}$ or better A1 for 8.485 to 8.486
	(d)	-1	2	M1 for $\frac{\text{rise}}{\text{run}}$
	(e)	$y = -x + 5$ oe	2 FT	M1 for $[y =] -x + k$ or $x + y = k$ FT from (d)

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13 (a)	72	1	
(b)	108	2	M1 for $\frac{2(180 - \text{their } 72)}{2}$ or $180 - \frac{360}{5}$ oe or B1 for 54
(c)	4.13 or 4.129...	2 FT	M1 for $\tan 54 = \frac{r}{3}$ oe FT $\frac{\text{their angle in (a)}}{2}$ or $\frac{\text{angle in (b)}}{2}$
(d)	61.9 – 62.[0]	3 FT	M2 for $\left(\frac{1}{2} \times 6 \times \text{their } 4.13\right) \times 5$ or M1 for $\frac{1}{2} \times 6 \times \text{their } 4.13$
14 (a)	Fully correct curve 	2	B1 for correct cubic shape (maximum then minimum)
(b) (i)	(–4, 0) (1, 0) (5, 0)	2	B1 for 2 correct
(ii)	(0, 10)	1	
(iii)	(3.27, –14.3) or (3.270.., –14.28 to –14.27)	2	B1 for each co-ordinate