Cambridge IGCSE

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Cambridge International General Certificate of Secondary Education

CAMBRIDGE INTERNATIONAL MATHEMATICS	**0607/31**
Paper 3 (Core)	**May/June 2016**
MARK SCHEME	
Maximum Mark: 96	

Published

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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
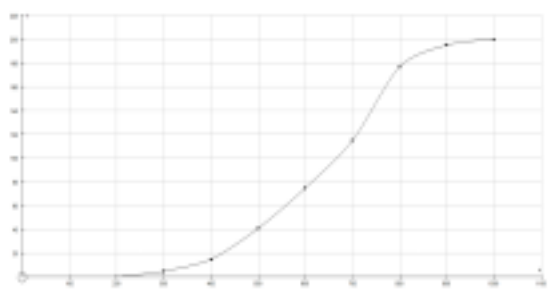
Question			Answer	Mark	Part Marks
1	(a)	(i)	356.3	1	
		(ii)	360	1	
		(iii)	400	1	
		(iv)	$3.56[31] \times 10^2$	1	
	(b)	(i)	279.14	1	
		(ii) (a)	20.86	1FT	**FT** 300 – *their* (b)(i)
		(b)	7.47 or 7.472 to 7.473	1FT	**FT** *their* (b)(ii) ÷ *their* (b)(i) × 100
2	(a)	(i)	4^6	1	
		(ii)	4096	1	
	(b)	(i)	272	1	
		(ii)	255	1	
	(c)		4^8	1	
3	(a)		27	1	
	(b)		10	1	
	(c)	(i)	50	1	
		(ii)	23	1 FT	**FT** *their* 50 – *their* 27
	(d)		$\dfrac{1}{20}$	2	**B1 FT** for $\dfrac{their\,23}{460}$

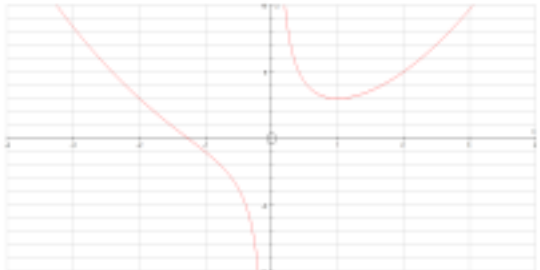|	Question	Answer	Mark	Part Marks
4	**(a)**		**2**	**B1** for 4 correct entries
	(b) (i)	8	**1**	
	(ii)	28	**1**	
	(iii)	29	**1**	
	(iv)	30	**1**	
	(c) (i)	$\frac{4}{20}$ oe isw	**1FT**	**FT** $\frac{their\,4}{20}$
	(ii)	$\frac{11}{20}$ oe isw	**1FT**	**FT** $\frac{2+their\,5+their\,4}{20}$
5	**(a) (i)**	1	**2**	**M1** for $5\times2-2\times3-\frac{1}{2}\times6$ or better
	(ii)	3.2	**3**	**M2** for $5B = 12 + 2 + 2$ or better (Allow 1 sign error e.g. $-5B$) or **M1** for $12 = 5B - 2(1) - \frac{1}{2}(4)$ or better
	(b)	−13	**2**	**M1** for $7 \times -3 - 4 \times -2$ or better
	(c)	$\frac{2y+9}{3}$ oe final answer	**2**	**M1** for correct first step
	(d)	6 kiwi – 2 kiwi = 840 – 480 oe kiwi =90 pomegranate + 2 × *their* 90 = 480 oe pomegranate = 300	**M1** **A1** **M1** **A1 FT**	OR **M1** for setting up two equations **M1** for eliminating one variable **A1** kiwi = 90 **A1** pomegranate = 300 second **A1** is **FT** If no working shown **SC1** for both answers correct
6	**(a)**	144	**2**	**M1** for $\frac{12}{30}\left[\times 360\right]$ seen or 48 × 3 or $\frac{60}{5}\times 12$
	(b)	Fully correct answer	**3**	**B2** for correct sectors but no labels or **B1** for 1 correct sector or **B1** for correct 3 labels according to size

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	Question		Answer	Mark	Part Marks
7	(a)	(i)	75	1	
		(ii)	105	1	
	(b)		$[p =]$ 70	1	
			$[q =]$ 20	1	
			$[r =]$ 20	1FT	**FT** *their q* or $90 -$ *their p*
			$[s =]$ 140	1FT	**FT** $70 +$ *their p* or $180 - 2 \times$ *their r*
8	(a)	(i)	1.61 or 1.606 to 1.607	2	**M1** for $\sin 40 = \dfrac{BC}{2.5}$ or better
		(ii)	4.11 or 4.106 to 4.107	1FT	**FT** $2.5 +$ *their* (a)(i)
	(b)		1.92 or 1.915…	2	**M1** for $\cos 40 = \dfrac{HB}{2.5}$ or better or **M1** for $2.5^2 -$ *their* 1.61^2
	(c)		1.02 or 1.016 or 1.02 to 1.03	1FT	**FT** $2 \times$ *their* (a)(i) $+$ *their* (b) $-$ *their* (a)(ii)
9	(a)		Correct points plotted (2, 3) and (5, 7)	2	**B1** for each correct point
	(b)		(3.5, 5)	1	
	(c)		$\dfrac{4}{3}$	2	**M1** for $\dfrac{rise}{run}$ or **B1** for 1.3
	(d)		$y = \dfrac{4}{3}x + 4$ oe final answer	2 FT	**FT** $y = their(c)\, x + 4$ oe **B1** for $y = their \dfrac{4}{3}x + k$ or $y = kx + 4$
10	(a)	(i)	47.1 or 47.12 to 47.13	1	
		(ii)	565 to 566	1 FT	**FT** *their* (a)(i) $\times 12$
	(b)		720	1	
	(c)		154 to 155	1 FT	**FT** *their* (b) $-$ *their* (a)(ii)
	(d)		21.39 to 21.53	1 FT	**FT** *their* (c) $\div$ *their* (b) $\times 100$

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Question	Answer	Mark	Part Marks
11 **(a)**	(0, 2), (–1, 1), (–2, 1), (–3, 2), (–2, 3)	**1**	
(b)	(2, –4), (3, –5), (4, –5), (5, –4), (4, –3)	**2**	**B1** for translation of $\begin{pmatrix} k \\ -6 \end{pmatrix}$ or $\begin{pmatrix} 2 \\ k \end{pmatrix}$ or **B1** for $\begin{pmatrix} -6 \\ 2 \end{pmatrix}$
(c)	(0, 6), (3, 3), (6, 3), (9, 6), (6, 9)	**2**	**B1** for any enlargement centre (0, 0) or correct shape, wrong position
(d)	3 : 1	**1**	
(e)	similar	**1**	
12 **(a)**	$700 \left[\leqslant x < \right] 800$	**1**	
(b) **(i)**	$\dfrac{(200+300)}{2} \left[= 250 \right]$ oe	**1**	
(ii)	638.5	**2**	**M1** for multiplying midpoints by frequencies (and adding) – implied by 127700
(c)	<table><tr><td>x < 300</td><td>5</td></tr><tr><td>x < 400</td><td>15</td></tr><tr><td>x < 500</td><td>41</td></tr><tr><td>x < 600</td><td>75</td></tr><tr><td>x < 700</td><td>115</td></tr><tr><td>x < 800</td><td>177</td></tr><tr><td>x < 900</td><td>195</td></tr><tr><td>x < 1000</td><td>200</td></tr></table>	**2**	**B1FT** for 2 correct entries
(d)	Fully correct curve or ruled polygon	**3FT**	**FT** only if increasing **B2FT** for *their* 4 or 5 points plotted correctly or **B1FT** for *their* 3 points plotted correctly

Question	Answer	Mark	Part Marks
(e) (i)	662 (660 to 680)	1FT	**FT** as long as it is an increasing curve
(ii)	230 (230 to 260)	2FT	**B1** for one correct quartile seen $(756 \pm 5$ or $526 \pm 5)$ **FT** as long as it is an increasing curve
(iii)	12 (8 to 16)	2FT	**B1** for 188 ± 4 seen or **M1** for clear method seen on graph **FT** as long as it is an increasing curve
13 (a)	Fully correct sketch 	4	**B1** for minimum in first quadrant **B1** for crossing x-axis approximately between –1 and –2 **B1** for not crossing y-axis **B1** for correct overall shape
(b)	$x = 0$	1	
(c)	(1, 3)	1	
(d)	3	1FT	**FT** *their* graph

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