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Cambridge International General Certificate of Secondary Education

MARK SCHEME for the May/June 2015 series

0607 CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/43 Paper 4 (Extended), maximum raw mark 120

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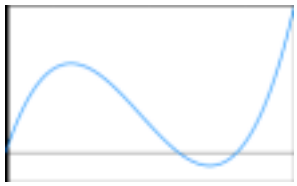
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Abbreviations

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)**	13 h 35 mins or 13 h 34.8 to 35 mins	**3**	**M1** for 11585 ÷ 852.9 **A1** for 13.58…
	(b)	[0]7 50 oe	**2**	**B1** for 13 50 or 17 20 or 25 50
	(c)	825 or 825.0 to 825.1...	**3**	**B1** for 28.08… hours or $28\frac{5}{60}$ oe **M1** for 23170 ÷ *their* 28.08
2	**(a) (i)**	Triangle (–1, 1), (–1, 2) (–3, 1)	**2**	**SC1** for rotation 90° clockwise about (0, 0) or rotation 90° anticlockwise about another point
	(ii)	Triangle (–1, –1), (–1, –2), (–3, –1)	**2FT**	**FT** *their* **(i)** or **SC1FT** for reflection in $x = 0$
	(iii)	Reflection $y = -x$	**1** **1**	
	(b)	Stretch [stretch factor] 3 Invariant line $x = 0$ oe	**1** **1** **1**	
3	**(a) (i)**	74.4[0]	**2**	**M1** for 80 × 0.93 oe or **SC1** for 18.4[0]
	(ii)	21.7 or 21.73 to 21.74	**4**	**M1** for 80 × 0.88 oe **A1** for reduction = \$4 M1A1 implied by 70.4[0] or 14.4[0] **M1** for $\frac{\textit{their}\text{ reduction}}{18.4} \times 100$
	(b) (i)	132.5[0]	**2**	**M1** for 143.1 ÷ 1.08
	(ii)	2.33 or 2.332	**2FT**	**M1** for 22 × (1.431 – *their*1.325) oe

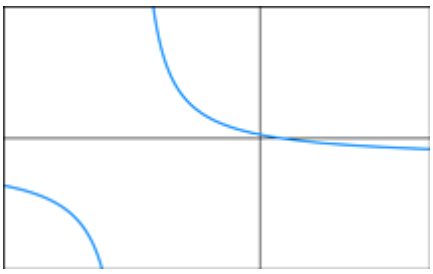
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4	**(a)**	(–4, 11)	**1, 1**	or **M1** for $\begin{pmatrix}2\\7\end{pmatrix}+\begin{pmatrix}-6\\4\end{pmatrix}$ or **SC1** for (8, 3)
	(b)	7.21 or 7.211... or $2\sqrt{13}$	**2**	**M1** for $\sqrt{4^2+6^2}$
	(c)	$y=-\frac{2}{3}x+4$ oe	**2**	**B1** for gradient = $-\frac{2}{3}$ or **SC1** for $y=mx+4$
	(d)	(3, 2)	**1**	
	(e)	$y=\frac{3}{2}x-\frac{5}{2}$ oe	**3**	**M1** for grad = $\frac{-1}{\textit{their}\text{ gradient}}$ **M1** for subs of *their* **(d)** into $y = mx + c$ oe
	(f)	Kite	**1**	
5	**(a)**	$x(40 – 2x)(30 – 2x)$ $1200 – 80x – 60x + 4x^2$	**2** **1**	or **B1** for $40 – 2x$ or $30 – 2x$ indep
	(b)		**2**	**B1** for any cubic curve ($+x^3$) with max & min
	(c)	2.19 or 2.192... 10 22.8 or 22.80 to 22.81	**1** **1** **1**	
	(d)	22.8 would produce negative width/length	**1**	oe
	(e)	3030 or 3032 to 3032.3... 28.7 or 28.68 to 28.69 or 18.7 or 18.68 to 18.69	**1** **1**	
6	**(a)** **(i)**	$4n – 2$	**2**	**B1** for $4n + k$
	(ii)	$(4n – 2) \times 10^{(n+1)}$ oe	**1FT**	*their* **(a)** $\times 10^{(n+1)}$
	(b) **(i)**	$2 \times 10^{[1]}, 2 \times 10^{-1}, 2 \times 10^{-3}, 2 \times 10^{-5}$	**2**	**B1** for 2 correct or $2 \times 10^{-3}, 2 \times 10^{-1}, 2 \times 10^{[1]}, 2 \times 10^{-3}$
	(ii)	$(2n – 1) \times 10^{(3n-2)}$	**3**	**B1** for $2n – 1$ **B2FT** for $10^{(3n-2)}$ or **M1** for $10^{(n+1)-(3-2n)}$ FT dep on **(a)(ii)** in correct form

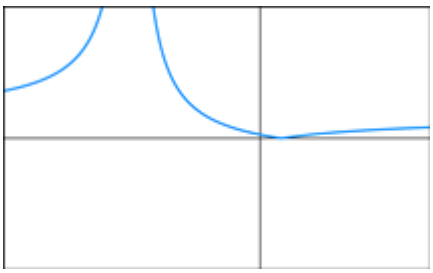
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7	**(a)**	86 [.0] or 86.03 to 86.04	**2**	**M1** for $\frac{AB}{150} = \cos 55$ oe
	(b)	246° or 245.5 to 245.6	**4**	**M2** for [cos =] $\frac{120^2 + 150^2 - 235^2}{2 \times 120 \times 150}$ (120.6) or **M1** for $235^2 = 120^2 + 150^2 - 2 \times 120 \times 150 \cos\theta$ **M1** for 125 + *their*120.6
	(c)	13 000 or 13 030 to 13 035	**3**	**M2** for $\frac{1}{2} \times 150 \times \textit{their}86 \times \sin 55$ oe $+\frac{1}{2} \times 120 \times 150 \times \sin(\textit{their}DAC)$ oe or **M1** for 1 of above areas soi by 5283 to 5285. … or 7746. ...
8	**(a)**	6.8 or 6800	**2**	**M1** for clear evidence of midpoints used soi by figs 68
	(b)	Correct plotting 7 correct points and drawing smooth curve	**5**	All FTS dep on increasing curve **B2** for correct cfs seen 8, 29, 60, 83, 93, 98, 100 or **SC1** for correct cfs with 1 error **B1FT** for 7 corrects height plotted **B1FT** for points plotted at 5, 6, 7, 8, 9, 10, 12 **B1 dep FT** for smooth curve dependent on increasing and dependent on **B1** for heights
	(c) (i)	10	**2FT**	**B1 dep** for 90 **FT** dependent on increasing curve
	(ii)	1600 to 1900	**2FT**	**B1dep FT** for 5.8 (or 5800) or 7.6 (or 7600) seen or answer 1.8 dependent on increasing curve
9	**(a) (i)**	$\frac{x}{x+40} = \frac{15}{20}$ oe	**1**	
		$20x = 15x + 40 \times 15$ oe	**1**	Accept 600 for 40 × 15
	(ii)	121 or 120.9… or $15\sqrt{65}$	**2**	**M1** for $\sqrt{120^2 + 15^2}$
	(iii)	40.3 or 40.24 to 40.35 or $5\sqrt{65}$	**2FT**	**M1** for *their* **(a)(i)** $\times \frac{40}{120}$ oe

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	(b) (i)	38 700 or 38 740 to 38 752	**3**	**M2** for $\frac{1}{3}\pi\times20^2\times160-\frac{1}{3}\pi\times15^2\times120$ oe or **M1** for either $\frac{1}{3}\pi\times20^2\times160$ or $\frac{1}{3}\pi\times15^2\times120$
	(ii)	5140 or 5139 to 5142	**4**	**M3FT** for π × 20 × (*their* **(a)(ii)** + *their***(a)(iii)**) – π × 15× (*their***(a)(ii)**) + π × 15² or **M2FT** for π × 20 × (*their* **(a)(ii)** + *their***(a)(iii)**) – π × 15× (*their***(a)(ii)**) or **M1** for for π × 20 × (*their* **(a)(ii)** + *their***(a)(iii)**) or π × 15× (*their***(a)(ii)**)
10	**(a)**	$\frac{6}{10},\frac{4}{10}$ oe	**1**	
		$\frac{4}{9},\frac{3}{9},\frac{2}{9}$ correctly positioned twice	**1**	
	(b) (i)	$\frac{18}{90}$ oe	**2**	**M1** for $\frac{6}{10}\times\frac{3}{10}$
	(ii)	$\frac{24}{90}$ oe	**3**	**M2 for** $\frac{6}{10}\times\frac{2}{9}+\frac{4}{10}\times\frac{2}{9}$ or **M1** for one of above products
	(iii)	$\frac{64}{90}$ oe	**3**	**M2** for 1 – *their* **(b)(i)** – $\frac{4}{10}\times\frac{3}{9}$ oe **M1** for one of $\frac{6}{10}\times\frac{4}{9}$, $\frac{6}{10}\times\frac{2}{9}$, $\frac{4}{10}\times\frac{4}{9}$, $\frac{4}{10}\times\frac{3}{9}$
11	**(a)**		**3**	**M1** Basic shape **A1** RH branch cuts both +ve axes **A1** asymptotes approximately right with no overlap
	(b)	$x=-3$ $y=-2$	**1** **1**	
	(c)	$-2<y\leq\frac{1}{3}$	**2**	May be separate, **B1** for either

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(d)		**2**	Correct shape **B1** for reflection of any part of **(a)** in x-axis
(e)	–4.75 –2.125 or –2.12 or –2.13	**1** **1**	
12 (a) (i)	–2	**1**	
(ii)	–7	**1FT**	
(b) (i)	$6 - 6x$ oe	**2**	**B1** for $4 - 2(3x - 1)$
(ii)	$\frac{4-x}{2}$ or $2 - \frac{x}{2}$ oe	**2**	**B1** for $x = 4 - 2y$ or $2x + y = 4$
(iii)	$\frac{11-13x}{(3x-1)(4-2x)}$	**3**	**M2** for $\frac{2(4-2x)-3(3x-1)}{(3x-1)(4-2x)}$ or **B1** for $2(4-2x)-3(3x-1)$ or **SC2** for $\frac{5-13x}{(3x-1)(4-2x)}$ or **M1** for common denominator $(3x - 1)(4 - 2x)$

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