CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0607 CAMBRIDGE INTERNATIONAL MATHEMATICS

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

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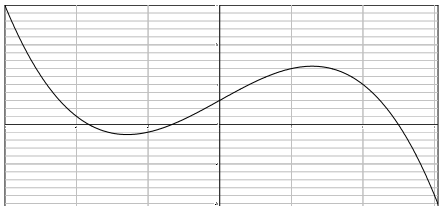
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1	**(a)**	\$80 000	**3**	**M2** for 65 600 ÷ 0.82 oe or **M1** for 65 600 = 82%
	(b) (i)	\$5463.12	**3**	**M2** for 5000 × 1.04 × 1.03 × 1.02 oe or **M1** for 5000 × (1.04 or 1.03 or 1.02) oe
	(ii)	\$26.79	**3**	**M1** for $5000 \times 1.04 \times 1.03 \times 1.02^3$ (or *their* **(b)(i)** $\times 1.02^2$) **M1** for 5000×1.025^5
2	**(a)**	(6, –1)	**1**	
	(b)	$y = \frac{3}{2}x - 10$ oe ISW	**4**	**B3** for answer $\frac{3}{2}x - 10$ or **B2** for $\frac{3}{2}$ oe or **B1** for gradient = $-\frac{2}{3}$ oe and **M1** for substituting *their* **(a)** into $y = (\textit{their } m)x + c$ See AG for other methods
	(c)	13	**2FT**	**FT** *their* **(b)** **B1** for (0, 3) soi Condone – 13
3	**(a)**	Rotation 90° [anticlockwise] oe About (2, 1)	**1** **1** **1**	
	(b) (i)	Triangle (5, 2) (3, –2) (5, –2)	**2**	**SC1** for enlargement centre (3, 2) s.f. 2 or $-k$ (not –1), or s.f. –2 any centre or 2 points correct
	(ii)	Enlargement centre (3, 2) Scale factor $-\frac{1}{2}$	**1** **1**	
	(c)	Triangle (2, 1) (–2, 1) (–2, 2)	**2**	**SC1** for 2 points correct or stretch with x-axis invariant, s.f. 2

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4	**(a)**	36.869…	**2**	**M1** for $\cos\theta = \frac{4}{5}$ oe
	(b)	41.2 or 41.18 to 41.19	**2**	**M1** for $\left(2 \times \frac{36.87}{360}\right) \times \pi \times 8^2$
	(c)	23.2 or 23.18 to 23.19	**2**	**M1** for $\frac{106.26}{360} \times \pi \times 5^2$
	(d)	12 [.00…]	**2**	**M1** for $\frac{1}{2} \times 8 \times 3$ or $\frac{1}{2} \times 5 \times 5 \times \sin(their\,106.26)$ oe
	(e)	14.9 or 15 or 14.90 to 15.05	**2**	$\pi \times 5^2$ – **(b)** – 2**(c)** + 2**(d)** evaluated **M1** for $\pi \times 5^2$ – **(b)** – 2**(c)** + 2**(d)**
5	**(a)**		**2**	Correct curve with turning points in correct quadrants **B1** for basic cubic shape with x^3 term negative
	(b)	–1.83 or –1.834… –0.657 or –0.6566… 2.49 or 2.490 to 2.491	**1** **1** **1**	If 0 scored **SC1** for all 3 correct to 2 s.f. If y-coordinates included, penalty of 1.
	(c)	(–1.29, –1.30) or (–1.291 to –1.290, –1.303…)	**1 + 1**	If 0 scored **SC1** for (1.29, 7.30) (1.2909 to 1.291, 7.303…)
	(d) (i)	Sketch of $y = 4 – 2x$ seen and crossing curve at all possible points in domain.	**M1**	
		–2.71 or –2.714…, 0.143 or 0.1432 to 0.1433, 2.57 or 2.571…	**B2**	**B1** for one solution
	(ii)	$x < –2.71$ $0.143 < x < 2.57$	**1FT** **1FT**	**FT** in order Condone ≤, accept in words

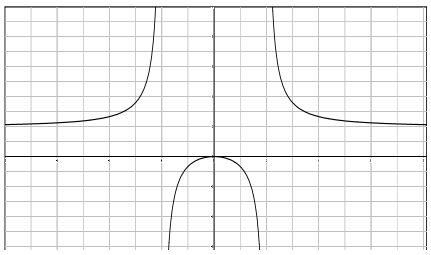
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6	**(a)**	133 or 133.3…	**2**	**M1** for $\left(\frac{8}{12}\right)^2$ oe seen
	(b)	2610 or 2612.7 to 2613	**4**	**M3** for $600 \times \left(\frac{800}{300}\right)^{\frac{3}{2}}$ oe or **M2** for $\left(\frac{800}{300}\right)^{\frac{3}{2}}$ oe or **M1** for $\sqrt{\frac{800}{300}}$ soi by 1.63… oe or height = 19.5959…
7	**(a) (i)**	$\mathbf{b} - \mathbf{a}$ oe	**1**	
	(ii)	$\frac{1}{2}\mathbf{a} + \frac{1}{2}\mathbf{b}$ oe	**1**	Allow unsimplified
	(iii)	$\frac{1}{3}\mathbf{a} + \frac{1}{3}\mathbf{b}$ or $\frac{1}{3}(\mathbf{a} + \mathbf{b})$	**2**	**M1** for $\frac{2}{3}$ *their* **(a)(ii)**
	(b) (i)	$-\mathbf{a} + \frac{1}{2}\mathbf{b}$ oe	**1**	
	(ii)	$\frac{1}{3}\mathbf{a} + \frac{1}{3}\mathbf{b}$ or $\frac{1}{3}(\mathbf{a} + \mathbf{b})$	**2**	**B1** for unsimplified or correct route
	(c)	Same Point	**1**	Dep on **(a)(iii)** and **(b)(ii)** correct
8	**(a)**	360 – 155 – 210 or 65 – 30 oe	**1**	Allow 360 – 325 and 35 + 155 + 210 = 360
	(b) (i)	54.5 or 54.53…	**3**	**M1** for $80^2 + 95^2 - 2 \times 80 \times 95 \times \cos 35$ **A1** for 2970 or 2973 to 2974
	(ii)	332 or 332.7…	**4**	**M2** for $\frac{80\sin 35}{\textit{their}\ \textbf{(b)(i)}}$ oe implied by [C =] 57.3 or 57.29… or **M1** for $\frac{\sin C}{80} = \frac{\sin 35}{\textit{their}\ AC}$ oe **M1** for *their* (360 – C + 30)
	(c) (i)	12 hours 24 minutes or 12 hours 23 to 24 minutes	**3**	**B2** for 12.4 or 12.39… **M1** for $\frac{80}{18} + \frac{95}{22} + \frac{\textit{their}\ 54.5}{15}$ and **B1** for correct conversion of *their* hours to hours and minutes
	(ii)	18.5 or 18.50 to 18.54 km/h cao	**2**	**M1** for $\frac{80 + 95 + \textit{their}\ 54.5}{\textit{their}\ \text{time}}$

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9	**(a)**	$\frac{3}{9}$ $\frac{1}{9}$ oe	**1**	In all parts accept decimal/percentages (correct to 3 s.f.) but not ratios etc. Also, ISW attempts to convert to decimals, %
		$\frac{4}{8}$ $\frac{3}{8}$ $\frac{1}{8}$, $\frac{5}{8}$ $\frac{2}{8}$ $\frac{1}{8}$, $\frac{5}{8}$ $\frac{3}{8}$ oe	**2**	**B1** for 1 set of branches for second ball correct
	(b) (i)	$\frac{6}{72}$ oe	**2**	**M1** for *their* $\frac{3}{9}$ × *their* $\frac{2}{8}$ (0.0833…)
	(ii)	$\frac{46}{72}$ oe	**3**	(0.63888…) **M2** 1 – *their* $\left(\frac{3}{9}\times\frac{2}{8}+\frac{5}{9}\times\frac{4}{8}\right)$ oe or **M1** for any 3 products giving different colours or $\frac{3}{9}\times\frac{2}{8}+\frac{5}{9}\times\frac{4}{8}$
	(c)	$\frac{5}{9}$ oe	**1**	
10	**(a)**	(4), 10, (16), 30, 22, (18)	**2**	**B1** for any 2 correct
	(b)	56.7	**2**	**M1** for evidence of midpoints 10, 30, 45, 55, 65, 85 (at least 3) used
	(c)	(4), 14, 30, 60, 82, (100)	**2FT**	**FT** from **(a)**, **B1** for any 2 correct
	(d)	Points plotted 1 Joined by smooth curve	**2FT** **1**	**B1FT** for 4 correct **FT** dep on increasing c.f.s
	(e) (i)	soil B with both medians indicated or line on graph	**1**	(Medians 57 ± 2, 71 ± 1)
	(ii)	soil B, by 6 to 10	**4**	**B3** for both iqrs 26 ± 2, 19 ± 2 or **B2** for one iqr If 0 scored **SC1** for lines at 25 and 75 or other clear indication
	(f)	18	**2FT**	**B1** for 82

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11	**(a)**		**3**	**B1** for each branch, middle branch must go through (0, 0), outside branches must not cross x-axis
	(b)	$f(x) \leq -\frac{2}{3}$ oe	**2**	Accept y, x, words. **M1** for $-\frac{2}{3}$ oe condone < for ≤ and ≤ for <
		$f(x) > 2$	**1**	
	(c) **(i)**	$x = 2$ $x = –2$ $y = 2$	**1** **1** **1**	
	(ii)	$x = –1$, $x = –5$ $y = 2$	**1FT** **1FT**	
12	**(a)**	$x(100 – 2x)$	**2**	**B1** for $100 – 2x$ oe seen
	(b)	sketch of $y = x(100 – 2x)$ or reaching $2x^2 – 100x + 900 = 0$ or all signs reversed sketch of $y = 900$ or $\frac{100 \pm \sqrt{(-100)^2 - 4(2)(900)}}{2 \times 2}$ or all signs reversed 11.8 or 11.77… or 38.2 or 38.22 to 38.23	**M1** **M1** **B1**	
	(c)	1250	**1**	
	(d)	796 or 795.6 to 795.87	**4**	**M1** for $2\pi r = 100$ oe **A1** for $r = 15.91…$ or $d = 31.8…$ **M1** for $\pi \times (\textit{their } r)^2$ with r from attempt at using circumference

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