

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

## **MARK SCHEME for the October/November 2014 series**

### **0607 CAMBRIDGE INTERNATIONAL MATHEMATICS**

**0607/42**

Paper 4 (Extended), maximum raw mark 120

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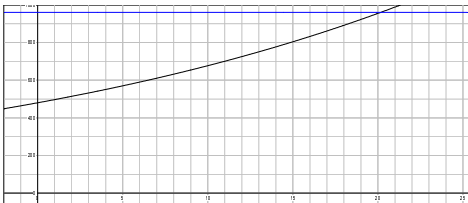
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<p><b>1</b> (a)</p> <p>(b)</p> <p>(c) (i)</p> <p>(ii)</p>	<p><math>600 \div 5 \times 4</math> oe</p> <p>537.60</p> <p>532.18</p> <p>21</p>	<p><b>M1</b></p> <p><b>4</b></p> <p><b>3</b></p> <p><b>3</b></p>	<p><b>B1</b> for [principal] =480 soi and</p> <p><b>M2</b> for <i>their</i> <math>480 + \frac{\textit{their} 480 \times 4 \times 3}{100}</math> oe</p> <p>or <b>M1</b> for <math>\frac{\textit{their} 480 \times 4 \times 3}{100}</math> oe</p> <p><b>M2</b> for <math>480 \times (1.035)^3</math> oe</p> <p>or <b>M1</b> for <math>480 \times (1.035)^k</math> oe <math>k \geq 2</math></p> <p><b>M2</b> for <math>\frac{\log 2}{\log 1.035}</math> oe or</p>  <p>or other appropriate graph which can clearly lead to answer</p> <p>or <b>M1</b> for <math>480(1.035)^n = 960</math> oe</p>
<p><b>2</b> (a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p> <p>(e)</p>	<p>0.3675</p> <p>[0]5 37</p> <p>87.3 or 87.27...</p> <p>2.55 or 2.545...</p> <p>420</p>	<p><b>1</b></p> <p><b>1</b></p> <p><b>2</b></p> <p><b>4</b></p> <p><b>3</b></p>	<p><b>M1</b> for <math>1200 \div \text{time in hours}</math> (<math>13 &lt; \text{time} &lt; 14</math>) oe</p> <p><b>B1</b> for 21 min or 0.35 h and <b>M2</b> for <math>\frac{\textit{their} 0.35}{13.75} \times 100</math> oe</p> <p>or <b>M1</b> for <math>\frac{\text{any time difference}}{13.75 \text{ or } 13.45} \times 100</math> oe</p> <p><b>M2</b> for <math>441 \div 1.05</math> oe</p> <p>or <b>M1</b> for recognising 441 as 105%</p>

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3	(a) (i)	10	1		
	(ii)	28	1		
	(iii)	20	1		
	(b) (i)	$\frac{18}{30}$ oe	1		
	(ii)	$\frac{19}{30}$	1		
	(c)	$\frac{42}{272}$ oe	3		M2 for $\frac{7}{17} \times \frac{6}{16}$ or M1 for product of fractions over 17 and 16
4	(a) (f) (i) (g) (i)	<p>Fully correct graph drawn</p>	2	B1 for reasonable shaped and separate branches but lacking reasonable accuracy	
	(b) (i)	(0, 0)	1	B1 B1	
	(ii)	(4, 8)	1		
	(c)	$[f(x)] \leq 0, [f(x)] \geq 8$ o.e.	2		
	(d)	1 or 2 or 3 or 4 or 5 or 6 or 7	1		
	(e)	$x = 2$	1		
	(f) (i)	Correct line drawn, positive gradient and approximately asymptotic	1		
	(ii)	Asymptote	1		
	(g) (i)	Correct curve drawn	2		B1 for reasonable shape but lacking reasonable accuracy
	(ii)	$2 < x$ $x < 2.48$ or 2.484 to 2.485 oe	2		B1 B1

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5	(a)	68	3	<b>B1</b> for $[ABC] = 44$ or $[XCB] = 136$ <b>B1</b> for $[BAC$ or $ACB] = 68$ or $[ACD] = 112$
	(b)	36	4	<b>B2</b> for $x = 10$ or <b>M1</b> for $15x + 20 + x = 180$ oe and <b>M1 FT</b> for $360 \div \textit{their } x$ <b>only</b> if answer is integer
	(c) (i)	30	1	
	(ii)	70	1	
	(iii)	100	1	
6	(a) (i)	18.1	2	<b>M1</b> if at least 2 mid-values soi
	(ii)	Correct histogram drawn	3	<b>B1</b> for correct widths no gaps <b>B2</b> for 4 correct heights or <b>B1</b> for 3 correct heights drawn
	(b) (i)	22	1	
	(ii)	12	2	<b>B1</b> for $[LQ] = 15$ or $[UQ] = 27$
	(iii)	10	2	<b>B1</b> for 90 seen

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7 (a)	Correct reduction method to eliminate one variable or correct sketch $x = -2$ $y = 3$	M1 B1 B1	SC1 for correct answers without working
(b)	$\frac{13 - 21k}{11}$ oe	4	B1 for common denominator of 21 oe B2 for $3(x + 2) - 7(2x - 1)$ or better or B1 for $3(x + 2)$ or $7(2x - 1)$
(c) (i)	$\frac{120}{x}$	1	
(ii)	$\frac{90}{x + 0.4}$	1	
(iii)	0.8[0] oe	4	M1 for <i>their (c)(i) + their (c)(ii) = 225</i>  A2 for sketch of $y = \frac{12}{x} + \frac{90}{x + 4}$ and $y = 225$ or other sketch which could lead to correct answer  or A1 for $120(x + 0.4) + 90x = 225x(x + 0.4)$ or better e.g. $225x^2 - 120x - 48 = 0$ and A1 for $(5x - 4)(45x + 12)$  or A2 for $\frac{- -120 \pm \sqrt{(-120)^2 - 4(225)(-48)}}{2(225)}$ oe

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8	(a)	$240^2 + 200^2 - 2 \times 240 \times 200 \cos 33$ 131 or 130.7 ...	M1	
	(b)	$\frac{\sin 77}{200} = \frac{\sin 68}{GB}$ oe 190 or 190.3 ...	M1	No further wrong working allowed B1 for $[BV^2 =]$ 17080 to 17090
	(c)	240 or 239.6 to 239.9	B2	If B0 then A1 for $\frac{200 \sin 68}{\sin 77}$
	(d) (i)	186	5	B1 for angle $MBG = 35^\circ$ soi  M1 for correct use of scale and conversion  M2FT for $\frac{1}{2} \times 24 \times 20 \sin 33 + \frac{1}{2} \times 20 \times \frac{\text{their}(b)}{10} \sin(180 - 68 - 77)$ or M1 for one of the triangles SC3 for figs 239.6 to 239.9... or 240
	(d) (ii)	265	1	
9	(a)	14 h 21 or 22 min	5	M2 for $\pi \times 80^2 \times 90 \div 35$ or M1 for $\pi \times 80^2 \times 90$ M1 FT for $\div 60 \div 60$  M1 FT for decimal part of hours into min
	(b)	440 000	4FT	FT 2 250 000 – <i>their</i> volume in (a) if seen  B3 for 440 000 to 441 000 or M2 for $150 \times 150 \times 100$ – <i>their</i> volume in (a) if seen or M1 for $150 \times 150 \times 100$ If B0 scored then B1 FT for rounding to 2 sf (if answer allows)
	(c)	$4.4 \times 10^5$	1FT	FT <i>their</i> (b)

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<b>10</b>	<b>(a) (i)</b>	$r + t$	<b>1</b>	<b>M1</b> for a correct route.
	<b>(ii)</b>	$\frac{1}{3}r - \frac{1}{3}t$ oe	<b>2</b>	
	<b>(b) (i)</b>	$\frac{1}{3}r$	<b>1</b>	
	<b>(ii)</b>	On $AB$ [extended] oe <b>dependent on part (b)(i)</b> being $kr$	<b>1dep</b>	
<b>11</b>	<b>(a)</b>	11	<b>2</b>	<b>B1</b> for $[f(2) =] 5$
	<b>(b) (i)</b>	Curve translated one to left	<b>2</b>	<b>B1</b> for any other translation parallel to $x$ -axis
		Translation	<b>1</b>	Marks independent
	<b>(c) (i)</b>	$\begin{pmatrix} -1 \\ 0 \end{pmatrix}$	<b>1</b>	
		$\sqrt[3]{x}$ or $x^{\frac{1}{3}}$	<b>1</b>	
		<b>(ii) (a)</b>	Correct curve	<b>1</b>
<b>(b)</b>		Reflection $y = x$	<b>1</b> <b>1</b>	
<b>12</b>	<b>(a)</b>	2.4	<b>3</b>	<b>M2</b> for $\left(\frac{h}{4}\right)^3 = \frac{108}{500}$ oe or better or <b>M1</b> for cube or cube root soi
	<b>(b)</b>	250	<b>2</b>	<b>M1</b> for $\frac{A}{90} = \left(\frac{4}{\text{their(a)}}\right)^2$ oe or better  or $\frac{A}{90} = \left(\sqrt[3]{\frac{500}{108}}\right)^2$ oe