

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

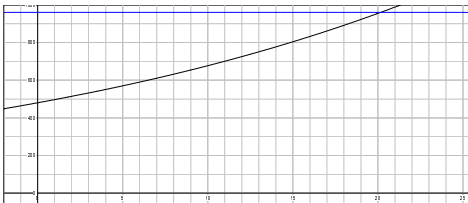
This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

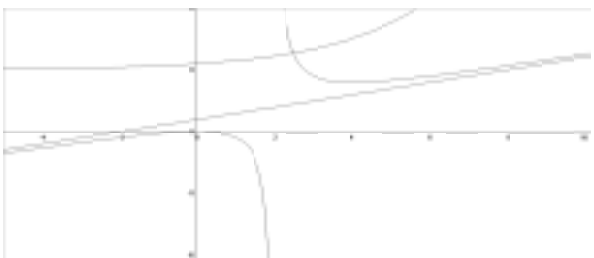
Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2014 series for most Cambridge IGCSE[®], Cambridge International A and AS Level components and some Cambridge O Level components.

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<p>1 (a)</p> <p>(b)</p> <p>(c) (i)</p> <p>(ii)</p>	<p>$600 \div 5 \times 4$ oe</p> <p>537.60</p> <p>532.18</p> <p>21</p>	<p>M1</p> <p>4</p> <p>3</p> <p>3</p>	<p>B1 for [principal] =480 soi and</p> <p>M2 for <i>their</i> $480 + \frac{\textit{their} 480 \times 4 \times 3}{100}$ oe</p> <p>or M1 for $\frac{\textit{their} 480 \times 4 \times 3}{100}$ oe</p> <p>M2 for $480 \times (1.035)^3$ oe</p> <p>or M1 for $480 \times (1.035)^k$ oe $k \geq 2$</p> <p>M2 for $\frac{\log 2}{\log 1.035}$ oe or</p>  <p>or other appropriate graph which can clearly lead to answer</p> <p>or M1 for $480(1.035)^n = 960$ oe</p>
<p>2 (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>1</p> <p>1</p> <p>2</p> <p>4</p> <p>3</p>	<p>M1 for 1200 \div time in hours (13 < time < 14) oe</p> <p>B1 for 21 min or 0.35 h and M2 for $\frac{\textit{their} 0.35}{13.75} \times 100$ oe</p> <p>or M1 for $\frac{\textit{any time difference}}{13.75 \text{ or } 13.45} \times 100$ oe</p> <p>M2 for $441 \div 1.05$ oe</p> <p>or M1 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	
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	
	(ii)	$2 < x$ $x < 2.48$ or 2.484 to 2.485 oe	2	

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5	(a)	68	3	B1 for $[ABC] = 44$ or $[XCB] = 136$ B1 for $[BAC$ or $ACB] = 68$ or $[ACD] = 112$
	(b)	36	4	B2 for $x = 10$ or M1 for $15x + 20 + x = 180$ oe and M1 FT for $360 \div \textit{their } x$ only if answer is integer
	(c) (i)	30	1	
	(ii)	70	1	
	(iii)	100	1	
6	(a) (i)	18.1	2	M1 if at least 2 mid-values soi
	(ii)	Correct histogram drawn	3	B1 for correct widths no gaps B2 for 4 correct heights or B1 for 3 correct heights drawn
	(b) (i)	22	1	
	(ii)	12	2	B1 for $[LQ] = 15$ or $[UQ] = 27$
	(iii)	10	2	B1 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)	4.4×10^5	1FT	FT <i>their</i> (b)

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