

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

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.

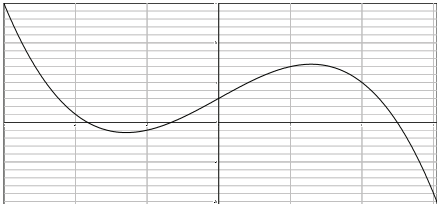
Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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.

Page 2	Mark Scheme	Syllabus 0607	Paper 43
Cambridge IGCSE – October/November 2014		0607	43

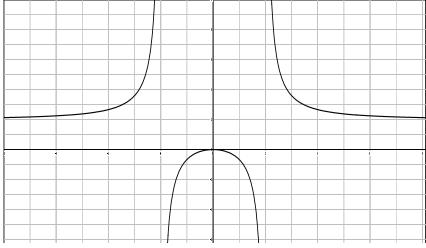
1	(a)	\$80 000	3	M2 for $65\,600 \div 0.82$ oe or M1 for $65\,600 = 82\%$
	(b) (i)	\$5463.12	3	M2 for $5000 \times 1.04 \times 1.03 \times 1.02$ oe or M1 for $5000 \times (1.04 \text{ or } 1.03 \text{ or } 1.02)$ oe
	(ii)	\$26.79	3	M1 for $5000 \times 1.04 \times 1.03 \times 1.02^3$ (or <i>their</i> (b)(i) $\times 1.02^2$) M1 for 5000×1.025^5
2	(a)	(6, -1)	1	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 <i>their</i> (a) into $y = (\text{their } m)x + c$ See AG for other methods
	(b)	$y = \frac{3}{2}x - 10$ oe ISW	4	
	(c)	13	2FT	
3	(a)	Rotation 90° [anticlockwise] oe About (2, 1)	1 1 1	SC1 for enlargement centre (3, 2) s.f. 2 or $-k$ (not -1), or s.f. -2 any centre or 2 points correct
	(b) (i)	Triangle (5, 2) (3, -2) (5, -2)	2	
	(ii)	Enlargement centre (3, 2) Scale factor $-\frac{1}{2}$	1 1	
	(c)	Triangle (2, 1) (-2, 1) (-2, 2)	2	

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

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)	b – 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 $\frac{80 \sin 35}{\text{their (b)(i)}}$ oe implied by [C =] 57.3 or 57.29... or M1 for $\frac{\sin C}{80} = \frac{\sin 35}{\text{their AC}}$ 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 $\frac{80}{18} + \frac{95}{22} + \frac{\text{their } 54.5}{15}$ 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 $\frac{80 + 95 + \text{their } 54.5}{\text{their time}}$

Page 5	Mark Scheme	Syllabus 1	Paper 4B
	Cambridge IGCSE – October/November 2014	0607	43

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 <i>their</i> $\frac{3}{9} \times \text{their} \frac{2}{8}$ (0.0833...)
	(ii)	$\frac{46}{72}$ oe	3	(0.63888...) M2 1 – <i>their</i> $\left(\frac{3}{9} \times \frac{2}{8} + \frac{5}{9} \times \frac{4}{8}\right)$ 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 $57 \pm 2, 71 \pm 1$)
	(ii)	soil B, by 6 to 10	4	B3 for both iqrs $26 \pm 2, 19 \pm 2$ 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

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 $f(x) > 2$	2 1	Accept y, x , words. M1 for $-\frac{2}{3}$ oe condone $<$ for \leq and \leq for $<$
	(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