

MARK SCHEME for the May/June 2013 series

0580 MATHEMATICS

0580/33

Paper 3 (Core), maximum raw mark 104

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.

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Abbreviations

cao	correct answer only
cso	correct solution only
dep	dependent
ft	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
www	without wrong working
soi	seen or implied

Qu.	Answers	Mark	Part Marks
1 (a)	$900 \times 86 \div 100 = 74$	2	M1 for $900 \times 14 \div 100$ A1 for $900 - 126 = 774$
(b)	[\$] 172	1	
(c)	[\$] 270	2	M1 for $480 \div (9 + 3 + 4)$
(d)	15.8 or 15.76(...)	2ft	B1 for $774 - \text{their (b)} - 480$ Or $294 - \text{their (b)}$ SC1 for 38 or 37.9
2 (a) (i)	11	1	
(ii)	144 or 4 or 0.25	1	
(iii)	0.25	1	
(iv)	$\sqrt{12}$	1	
(v)	40 cao	2	B1 for 80 or any common multiple of 40
(vi)	2	1	
(b) (i)	3	1	
(ii)	3 [×] 11 [×] 61	2	B1 for two of 3, 11 and 61 seen

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3	(a)	2	1	
	(b)	Reflection $x = -1$	1 1	
	(c) (i)	Translation $\begin{pmatrix} -7 \\ -5 \end{pmatrix}$	2	B1 for 7 left or 5 down SC1 for translation $\begin{pmatrix} -5 \\ -7 \end{pmatrix}$
	(ii)	Rotation 90° clockwise about the origin shown.	2	B1 for any other rotation of 90° about other point
	(d) (i)	Correct enlargement shown	2	B1 for an enlargement with any correct scale factor and/or correct shape incorrect position
	(ii)	3, 2	1, 1	SC1 for 2, 3
	(iii)	3	2ft	M1 their $LM \times$ their height $\div 2$
	(iv)	27	2ft	M1 their base \times their height $\div 2$ from their enlarged triangle.
4	(a) (i)	7, -1, 2	2	B1 for any 2 correct
	(ii)	8 points plotted Correct smooth curve	3ft 1	P2ft for 6 or 7 correct P1ft for 4 or 5 correct
	(b)	$x = 1$	1	
	(c) (i)	Two correct points	1,1	$x \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4$ $y \quad 6 \quad 5 \quad 4 \quad 3 \quad 2 \quad 1 \quad 0$
	(ii)	Correct line drawn	1	Must be ruled and continuous
	(iii)	-1.9 to -1.7, 2.7 to 2.9	2ft	1 for each correct
5	(a) (i)	(0)35 to (0)39	1	
	(ii)	117.6 to 122.4 [km]	2	B1 for (10 ± 0.2) cm seen
	(iii)	80 or 78.4 to 81.6	1ft	ft their (a)(ii) $\div 1.5$
	(b)	Bisector of angle CBD with 2 correct pairs of arcs.	2	B1 correct line ($\pm 2^\circ$), some or all arcs absent
	(c)	Ruled line from C to BD on a bearing of 165°	1	
	(d)	1 [h] 18 [min] to 1 [h] 26 [min] www	4	B1ft measure BE M1 change to kilometres. M1 for their distance $\div 55$
	(e)	Circle, centre D , with radius 2.5 ± 0.2 cm	2	M1 for 2.5 ± 0.2 soi. SC1 for circle, centre D , incorrect radius or freehand 'correct' circle

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6	(a) (i)	Frequency table completed	2	M1 for 8 correct frequencies SC1 for all correct tallies if no frequencies. OR SC1 for all correct frequencies in tally column
	(ii)	$\frac{3}{70}$ oe	1 ft	ft their table
	(b) (i)	6	1	
	(ii)	10	1	
	(iii)	6	2	M1 for clear recognition of mid values used
	(iv)	6.43 to 3sf	3	M1 for total of freq \times their result M1 dep for division by their 70
	(c) (i)	All totals filled in	1	Allow 1 error or omission
	(ii)	More ways of getting 7	1	Any equivalent explanation
7	(a) (i)	Trapezium	1	
	(ii)	$\frac{h}{5.5} = \sin 70$ or better 5.17 or 5.16(8...) seen	M1 A1	
	(iii)	54.3 or 54.34 or 54.(0...)	2	M1 for $0.5 (8.4 + 12.5) \times 5.2$ oe
	(iv)	370	2ft	B1ft Their (a)(iii) $\times 6.8$ not correctly rounded to 2sf
	(b) (i)	64 21 116	1 1ft 1	ft 85 – their (b)(i)
	(ii)	154	2ft	M1 for $540 - (90 + 95 + 64 + \text{their } x + \text{their } y)$
8	(a) (i)	$4m$	1	
	(ii)	$2e - 10f$	2	B1 for $ae - 10f$ or $2e \pm bf (a, b \neq 0)$
	(b) (i)	-3	2	M1 for $27 + (-2) \times 15$ or better
	(ii)	$[t=] \frac{s-u}{a}$ or $\frac{s}{a} - \frac{u}{a}$	2	M1 first step correct SC1 for $s - u \div a$ www
	(c)	$[x =] 2, [y =] -3$	3	M1 for correct method to eliminate one variable. A1 for x or y correct

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9	(a) (i)	243 Multiply by 3 oe	1 1	Add 1 first and keep adding 2 more each time
	(ii)	27 Add next odd number oe	1 1	
	(iii)	$\frac{1}{4}$ or 0.25 Halve or divide by 2	1 1	
	(iv)	80 Multiply by -2 oe	1 1	
	(b) (i)	37, 45	1, 1ft	ft is (ans) + 8
	(ii)	$8n - 3$ oe final answer	2	B1 for $8n + a$ or $bn - 3$ ($b \neq 0$)
	(iii)	797	1ft	Only follow through a linear expression