

MARK SCHEME for the October/November 2013 series

0580 MATHEMATICS

0580/32

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

Question.	Answers	Mark	Part Marks
1	(a) Scalene [triangle]	1	
	(b) Congruent	1	
	(c) (i) translation $\begin{pmatrix} -6 \\ 2 \end{pmatrix}$	1 1	Accept 6 left and 2 up.
	(ii) rotation 180° [Centre] (0,0)	1 1 1	SC1, 1, 1 for Enlargement, [SF=] -1,(0,0)
	(d) Image (1, -2), (4, -2), (2, -3)	1	
	(e) Image (2, 4), (8, 4), (4, 6)	2	B1 for 2 times enlargement, incorrect centre
	(f) 6	2FT	M1 for $0.5 \times \textit{their} \textit{ base} \times \textit{their} \textit{ height}$

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2	<p>(a) (i) $\frac{5}{9}$</p> <p>(ii) 60</p> <p>(b) 1080</p> <p>(c) 0.85×3450 Or $3450 - 0.15 \times 3450$</p> <p>(d) 32</p>	2 2 3 2 3	<p>B1 for $\frac{80}{144}$ or better or 0.556 or 0.555... or answer $\frac{4}{9}$</p> <p>M1 for $144 \div (6+5+1)$ or $144 \div 12$</p> <p>M1 for $2 \div 5 \times 5200$ soi by 2080 And M1 for <i>their</i> $2080 + 24 \times 175 - 5200$ or better</p> <p>B1 for 0.85 or for 0.15×3450</p> <p>M2 for $\frac{3300-2500}{2500} \times 100$ oe or $(\frac{3300}{2500} - 1) \times 100$ oe</p> <p>Or B1 for 800 or $\frac{3300-2500}{2500}$ or $\frac{3300}{2500}$ or 1.32 or 132 or 0.32</p>
3	<p>(a) (i) $4n + 21$, final answer</p> <p>(ii) $5n + 3 = 3n + 27$ [$n =$] 12</p> <p>(iii) 126</p> <p>(b) (i) yellow</p> <p>(ii) arrow pointing at 0.5</p> <p>(iii) $\frac{4}{20}$ o.e. or 0.2 or 20%</p> <p>(iv) $\frac{16}{20}$ o.e. or 0.8 or 80%</p>	1 1 2 1FT 1 1 1 1FT	<p>M1 for $5n - 3n = 27 - 3$ or better</p> <p>SC1 for 4 out of 20 and 16 out of 20</p>

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4	(a) (i) 370 to 380	2	B1 for 7.4 to 7.6 seen B1 for one correct arc or C correct with no arcs	
	(ii) [0]36 to [0]40	1		
	(iii) Intersecting arcs: Arc centre A radius 10.5 cm Arc centre B radius 7 cm	2		
	(iv) 300 to 310	1FT		
	(b) 11 25	3		
	(c) 4200	1		
5	(d) 13.1	2	M2 for $525 \div 700 \times 60$ or better soi Or M1 for $525 \div 700$ soi by 0.75 B1 for 13 100 or 13.107 or 13.100 Or B1FT <i>their</i> conversion to 4 or more sig figs seen and then correctly rounded to 3 sig figs	
	(e) 8515	1		
	(a) -1 -1.25 2.5 1	2		B1 for two correct P2FT for 8 or 9 correctly plotted P1FT for 6 or 7 correctly plotted
	(b) 10 correctly plotted points Two correct smooth curves through all correct points and not across y-axis	P3FT C1		
	(c) 1.15 to 1.35	1FT		
(d) (i) Line $x = -3.5$ ruled	1			
(ii) (5, -3) plotted	1			
(iii) line $y = -3$ ruled	1FT			

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6	(a) (i) 26	1	B1 for each B1 for one correct in correct position or FT for fourth term B1 for $5n + k$, $jn + 3$ $j \neq 0$ Or $5n + 3$ oe not as final answer M1FT for <i>their</i> (c)(ii) = 98 if linear soi
	(ii) 16	1	
	(iii) 17 –3	2	
	(b) (i) 9 17	2	
	(ii) odd	1	
	(c) (i) 23	1	
(ii) $5n + 3$ oe final answer	2		
(iii) 19	2		
7	(a) 23	2	M1 for clear attempt to find middle If zero scored then SC1 for 40 M1 for $(36+38+42+36+45+42+32+40+40+46+56+38) \div 12$ implied by $491 \div 12$ If zero scored then SC1 for 26.25 or 26.3 P1 for 4 or 5 correctly plotted dep on at least 11 points on graph
	(b) [Affected by an] extreme value oe	1	
	(c) 40.9	2	
	(d) (i) 6 points correctly plotted	P2	
	(ii) positive	1	
	(iii) line of best fit ruled and continuous	1	
(iv) No, [estimate unreliable as] outside range [of data]	1		

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8	(a) 7 Pentagon	1 1	
	(b) (i) trapezium	1	
	(ii) 125°	1	
	(iii) 32°	2	M1FT for $180 - 125 - 23$ or better or $180 - \textit{their} 125 - 23$ or better
	(c) (i) 90° angle [in a] semicircle [= 90°]	1 1	
	(ii) 55°	1	
	(iii) 93°	3	M2 for $90 - 52$ or $180 - 90 - 52$ or 38 If M0 then B1 for angle $CAD = 90^\circ$ indicated
9	(a) (i) 7	1	Allow -7
	(ii) -32	1	
	(iii) -11	1	
	(b) (i) 1.05×10^7	1	
	(ii) 4 580 000	1	
	(iii) Kaliningrad	1	
	(iv) 2.7×10^5	2	B1 for figs 27
10	(a) 3.5	2	M1 for $6x - 12 = 9$ or better or $x - 2 = \frac{9}{6}$ or better
	(b) $2n - 18$ or $2(n - 9)$ final answer	2	B1 for $8n - 8$ or $-6n - 10$ or $2n$ or -18
	(c) $5p^2(2 + p)$ final answer	2	M1 for any correct incomplete factorisation or $5p^2(2 + p)$ seen in working