CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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	**1**	
	$\begin{pmatrix} -6 \\ 2 \end{pmatrix}$	**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 × *their* base × *their* height

2	**(a) (i)** $\frac{5}{9}$	**2**	**B1** for $\frac{80}{144}$ or better or 0.556 or 0.55 answer $\frac{4}{9}$
	(ii) 60	**2**	**M1** for 144 ÷ (6+5+1) or 144÷12
	(b) 1080	**3**	**M1** for 2 ÷ 5 × 5200 soi by 2080 And **M1** for *their* 2080 + 24×175 – 5200 or better
	(c) 0.85 × 3450 Or 3450 – 0.15 × 3450	**2**	**B1** for 0.85 or for 0.15 × 3450
	(d) 32	**3**	**M2** for $\frac{3300-2500}{2500}\times 100$ oe or $\left(\frac{3300}{2500}-1\right)\times 100$ oe **Or** **B1** for 800 or $\frac{3300-2500}{2500}$ or $\frac{3300}{2500}$ or 1.32 or 132 or 0.32
3	**(a) (i)** $4n + 21$, final answer	**1**	
	(ii) $5n + 3 = 3n + 27$	**1**	
	$[n =] 12$	**2**	**M1** for $5n – 3n = 27 – 3$ or better
	(iii) 126	**1FT**	
	(b) (i) yellow	**1**	
	(ii) arrow pointing at 0.5	**1**	
	(iii) $\frac{4}{20}$ o.e. or 0.2 or 20%	**1**	
	(iv) $\frac{16}{20}$ o.e. or 0.8 or 80%	**1FT**	**SC1** for 4 out of 20 and 16 out of 20

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

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

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 – *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° 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