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Cambridge International General Certificate of Secondary Education

MARK SCHEME for the May/June 2015 series

0580 MATHEMATICS

0580/31 Paper 3 (Core), maximum raw mark 104

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Abbreviations

cao correct answer only
dep dependent
FT follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
nfww not from wrong working
soi seen or implied

Question	Answer	Mark	Part marks
1 (a) (i)	At least two of 1, 2, 3, 4, 6, 12	**1**	No incorrect factors
(ii)	23	**1**	
(iii)	4	**1**	
(iv)	2 000 507	**1**	
(v)	e.g. 75, 150	**1**	Accept any $75k$, $k > 0$
(vi)	3.1416	**1**	
(b) (i)	163	**1**	
(ii)	7.5	**1**	
(c) (i)	63521.8	**1**	
(ii)	63500 cao	**1**	
(d) (i)	[0].234	**1**	
(ii)	8 760 000	**1**	
2 (a) (i)	rotation [centre] (0, 0) oe 90° clockwise oe	**1** **1** **1**	
(ii)	reflection y-axis or $x = 0$	**1** **1**	
(iii)	translation $\begin{pmatrix} -8 \\ -5 \end{pmatrix}$	**1** **1**	
(b)	correct enlargement shown	**2**	**B1** for enlargement of sf 2 anywhere on the grid

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Question	Answer	Mark	Part marks
3 (a) (i)	6	1	
(ii)	0.21	2	**M1** for $\frac{220}{38}$ or better
(b) (i)	5, 15, 20	2	**B1** for 1 correct answer in the right place or **M1** for 40 ÷ (1 + 3 + 4) [×*k*] soi where *k* is 1 or 3 or 4
(ii)	2 : 3 : 5	2	**M1** for (16,24,40) or better or **M1FT** for '*their* (5,15,20)' + (11,9,20) or better
(c) (i)	570	1	
(ii)	$b + 2t = 240$	2	**B1** for $b + 2t$ seen
(iii)	[*b*] 90 [*t*] 75 Working must be shown	3	**M1FT** for correct elimination of one variable **A1** for $b = 90$ **A1** for $t = 75$ If zero is scored **SC1** for 2 values satisfying one of their equations (ft) **SC1** if no working shown, but 2 correct answers given
(d)	16.83	3	**B1** for 340 or 0.2 or 5 seen **M1** for figs 340 ÷ figs 20 × figs 99 or figs 340 × figs 5 × figs 99
4 (a) (i)	292	1	
(ii)	380	2	**B1** for (9.5 ± 0.2) If zero scored, **SC1** for figs '372 to 388'
(iii)	125	2	**M1** for $\frac{450 \times 1000}{60 \times 60}$ or better
(b) (i)	0.85	1	
(ii)	36	1	
(c) (i)	6	1	
(ii)	16	1	
(iii)	17	1	
(iv)	17.5	2	**M1** for (15+16+16+18+19+21) ÷ 6

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Question	Answer	Mark	Part marks
(v)	$\frac{2}{6}$ oe	1	
(d) (i)	2.62	2	**M1** for 3.25 ÷ 1.24
(ii)	245, 255	2	**B1** for one correct or both correct but reversed
5 (a)	green	1	
(b)	72	3	**B1** for 135° ± 2° seen **M1** for $\frac{360 \times 27}{their\ 135}$ oe
(c)	22.2	2	**M1** for $\frac{80 \pm 2}{360} \times 100$ or **M1FT** for $\frac{their\ \text{red}}{their\ \text{total}} \times 100$
6 (a) (i)	2	1	
(ii)	0	1	
(iii)	360	1	
(b) (i)	correct bisector drawn with 2 pairs of correct arcs reaching *DC*	2	**B1** for correct bisector without arcs reaching *DC* or correct bisector with 2 pairs of arcs not reaching *DC*
(ii)	alternate [angles]	1	
(iii)	isosceles [angle] *DAE* = [angle] *DEA* oe	1 1	
(iv)	trapezium	1	

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Question	Answer	Mark	Part marks
7 (a) (i)	Brookland to Cawley and [gradient is] steeper oe	1	
(ii)	100	2	**M1** for $\frac{35-10}{\text{time}}$ oe
(b) (i)	correct graph	2	**B1** for horizontal line (0940, Cawley) to (0950, Cawley) **B1FT** for line (*their* 0950, Cawley) to (*their* 0950 + 30, Audley)
(ii)	10 20	1FT	
(c)	1400	2	**B1** for 300 or 5 h or 2:00 or 2 o'clock or any 2 of 10:40, 12:20(FT) or 14:00(FT)/2:00(FT) If zero scored, **SC1** for 1540 or 3:40pm
8 (a)	153	2	**M1** for 90 + 63 or 180 − (90 + 63) oe or [angle *BCA* =]27
	two correct geometrical reasons	2	**B1** for angle [in] semi-circle [is 90] **B1** for angles [in a] triangle [sum to] 180 or angles [on a] straight line [sum to] 180
(b)	14.8 or 14.79 to 14.80	5	**M2** for $\frac{3}{4}\times\pi\times3^2$ or **M1** for $\pi\times3^2$ **M1** for 6 × 6 or 36 **M1 dep** for *their* 6 × 6 – *their k* × π × 3^2
(c) (i)	36	3	**M2** for $\sqrt{45^2-27^2}$ or better or **M1** for $45^2 = GH^2 + 27^2$ or better
(ii)	108	1FT	
(iii)	486	2FT	**M1FT** for 0.5 × 27 × *their* **(c)(i)**

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Question	Answer	Mark	Part marks
9 (a) (i)	0, 6, 6, –6	**2**	**B1** for any 3 correct
(ii)	8 points correctly plotted correct smooth curve	**4**	**B3FT** for 7 or 8 correct **B2FT** for 5 or 6 correct **B1FT** for 3 or 4 correct
(b)	$(2.5, k)$ where $6 < k \leqslant 6.5$	**1**	
(c)	5.4 to 5.7 −0.4 to −0.7	**1FT** **1FT**	
(d) (i)	correct line drawn	**1**	
(ii)	$x = 2.5$	**1**	
(iii)	15	**1**	

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