CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 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)	26 39 65 44 11 55 70 50 120	2	**B1** for 3 or 4 correct
(ii)	$\frac{11}{30}$ cao	2	**B1** for $\frac{44}{120}$ or $\frac{22}{60}$
(iii)	2 : 3 cao	2	**B1FT** for $2k : 3k$ where k is an integer or *their* 26 : *their* 39 or better with integer values
(b) (i)	7.53	2	**M1** for attempt at ordered list, or 7.34 and 7.72 identified
(ii)	3.65	1	
(iii)	10.06 6.01	2	**B1** for 1 correct
2 (a) (i)	24 or 30	1	
(ii)	25	1	
(iii)	27	1	
(iv)	23 or 29	1	
(b) (i)	17	1	
(ii)	243	1	
(iii)	1	1	

Question	Answer	Mark	Part marks
(iv)	0.0625 or $\frac{1}{16}$	1	
(c) (i)	$2^2 \times 3 \times 7$ or $2 \times 2 \times 3 \times 7$	2	**B1** for 2, 2, 3, 7
(ii)	42	2	**B1** for $2 \times 3 \times 7$ or 2 or 3 or 6 or 7 or 14 or 21 as answer or [126 =] $2 \times 3^2 \times 7$ or $2 \times 3 \times 3 \times 7$
3 (a) (i)	565.25	2	**M1** for $\left(1-\frac{5}{100}\right)\times 595$ oe
(ii)	42.75	2FT	**2FT** if positive difference (ie **(a)(i)** < 608) **M1** for 38×16 (or 608) – *their* **(a)(i)**
(b)	9.2[0…]	2	**M1** for $\left(\frac{26272-23854}{26272}\right)\times 100$ oe or $\left(1-\frac{23854}{26272}\right)\times 100$ oe or $100-\frac{23854}{26272}\times 100$ oe
(c)	5.07×10^5 cao	2	**B1** for figs 507 or for $a \times 10^5$ ($a \neq 0$)
(d) (i)	120° 80°	3	**B2** for one correct or **M1** for $\frac{15}{45}\times 360$ or $\frac{10}{45}\times 360$ or $\frac{160}{20}\times 15$ or $\frac{160}{20}\times 10$ or better
(ii)	Pie chart correct	1FT	**FT** if *their* angles add to 200°
(e)	3.84×10^6	2	**B1** for answer figs 384

Question	Answer	Mark	Part marks
4 (a) (i)	$m + 5$	1	
(ii)	$2m$	1	
(iii)	$m + m + 5 + 2m = 47$ isw	1FT	**FT** m + *their* **(a)(i)** + *their* **(a)(ii)** = 47 isw or $4m + 5 = 47$ isw
(iv)	10.5 15.5 21	3	**M1FT** for correct first step to solve *their* **(a)(iii)** **A1FT** for $m = 10.5$
(b) (i)	Yes, [total =] 114.5 [cm]	2	**M1** for 55 + 39.5 + 20 oe or for 1145 mm
(ii)	5.5	1	
(c) (i)	102	1	
(ii)	37.5[0]	2	**M1** for 25.5[0] ÷ 0.68

Question	Answer	Mark	Part marks
5 (a) (i)	4.8	2	**B1** for 9.6 seen
(ii)	137	1	
(b)	Correct length and bearing	2	**B1** for $AC = 6.4$ cm **B1** for correct bearing 310°
(c)	Perpendicular bisector with 2 sets of correct arcs	2	**B1** for correct line with some or no or incorrect arcs or **B1** for 2 sets of correct arcs
(d)	Correct area shaded	3	**B2** for arc centre B radius 6 cm touching *their* bisector twice or **B1** for arc centre B, with radius 6 cm but incorrect length or for arc centre B, with incorrect radius
(e)	11 03	3	**M2** for $12 \div 15 \times 60$ or **M1** for $12 \div 15$ soi If zero scored, **SC1** for *their* time added to 10 15 correctly
6 (a)	Cylinder	1	
(b)	Cube or cuboid	1	
(c) (i)	$\sqrt{6^2 - 3^2}$ 5.19…	M2 A1	**M1** for $6^2 = 3^2 + BC^2$ or $(BC^2 =)\ 6^2 - 3^2$
(ii)	7.79 to 7.8	2	**M1** for $0.5 \times 5.2 \times 3$
(iii)	62.4	1FT	**FT** $8 \times$ *their* **(c)(ii)**
(d) (i)	28	2	**M1** for $0.5 \times (6 + 8) \times 4$ oe
(ii)	12	1FT	**FT** $336 \div$ *their* **(d)(i)**

Question	Answer	Mark	Part marks
7 (a) (i)	–2, –3, –6, 3	**2**	**B1** for 2 or 3 correct
(ii)	Correct curves	**4**	**B3FT** for 9 or 10 correctly plotted points or **B2FT** for 7 or 8 correctly plotted points or **B1FT** for 5 or 6 correctly plotted points
(iii)	Ruled line $y = 4$	**1**	
(iv)	(1.4 to 1.6, 4)	**1**	**SC1** for (4, 1.4 to 1.6) from line $x = 4$ drawn
(b) (i)	(–1, –3) plotted	**1**	
(ii)	Correct ruled line	**1FT**	**FT** line with gradient 2 through *their A*
(iii)	$2x - 1$	**2FT**	**FT** $2x$ + *their* y-intercept for 2 marks **B1** for $2x + k$ or $mx - 1$ ($m \neq 0$) or mx + *their* y-intercept ($m \neq 0$)

Question	Answer	Mark	Part marks
8 (a) (i)	2	1	
(ii)	Two correct lines of symmetry drawn	2	**B1** for one correct line
(b) (i)	Correct reflection	2	**B1** for reflection in $x = k$ or $y = -1$
(ii)	Correct enlargement	2	**B1** for correct shape, incorrect position or enlargement correct centre, incorrect scale factor
(iii)	Rotation 90° clockwise oe [Centre] (0, 0) oe	**B1** **B1** **B1**	
9 (a)	$2x$ final answer	2	**M1** for $6x + 4$ or $-4x - 4$
(b)	$3y(y - 2)$ final answer	2	**B1** for $3(y^2 - 2y)$ or $y(3y - 6)$
(c)	$4a + 20$ or $4(a + 5)$	2	**M1** for $a + 5 = \frac{b}{4}$ or $4a = b - 20$
(d)	Correct working and $[x =]$ 5, $[y =] -2$	3	**M1** for correctly eliminating one variable **A1** for $x = 5$ **A1** for $y = -2$ If zero scored, **SC1** for 2 values satisfying one of the original equations **SC1** if no working shown, but 2 correct answers given