Cambridge IGCSE

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MATHEMATICS	**0580/33**
Paper 3 (Core)	**May/June 2016**
MARK SCHEME	
Maximum Mark: 104	

Published

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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)	$11 \div (11 + 14 + 5) \times 18$	1	
(ii)	[paths] 8.4 [buildings] 3[.0]	1 1	
(b)	[Mammals] 4.2 [Reptiles] 1.98	1 1	
(c) (i)	7 [h] 45 [min]	1	
(ii)	55 [h] 45 [min]	2FT	**B1** for 55.75 seen or 38 [h] 45 [min] or 17 [h] soi or **M1FT** for $5 \times$ *their* (c)(i) $+ 2 \times 8$ [h] 30 [min] or better
(d) (i)	[$] 48[.00]	2	**M1** for $2 \times 11 + 2 \times 9.25 + 7.50$ or better If M0 then **SC1** for 55.50
(ii)	12.5	3FT	**M2** for $\dfrac{their(d)(i) - 42}{their(d)(i)}[\times 100]$ or $\left(100 - (\dfrac{42}{their(d)(i)} \times 100)\right)$ or **M1** for $\dfrac{42}{their(d)(i)}$ or figs 875 or **B1** for *their (d)(i)* – 42 or *their* 6 seen
2 (a) (i)	10	2	**M1** for $360 \div 36$
(ii)	144	1	
(iii)	1440	1FT	*their* (a)(i) $\times$ *their* (a)(ii)

Question	Answer	Mark	Part marks
(b) (i)	5.5 or $5\frac{1}{2}$	1	
(ii)	Translation	1	
	$\begin{pmatrix} -3 \\ -8 \end{pmatrix}$	1	
(iii) (a)	Correct reflection	2	**B1** for reflection in $x = k$ or reflection in $y = 2$
(iii) (b)	Correct enlargement	2	**B1** for correct scale factor and orientation but incorrect centre
3 (a) (i)	754 or 753.9 to 754.1	2	**M1** for $\pi \times 4^2 \times 15$ or better
	cm^3 or cubic centimetres	1	Independent mark
(ii)	427 or 427.2 to 427.312	2	**M1** for $2 \times \pi \times 4 \times 15 + \pi \times 4^2$ or better
(b)	$\dfrac{A - \pi r^2}{2\pi r}$ oe final answer	2	**B1** for $A - \pi r^2 = 2\pi rh$ or better or $\dfrac{A}{2\pi r} = h + \dfrac{\pi r^2}{2\pi r}$ or better
(c)	$\pi r(2h + r)$ final answer	2	**B1** for $\pi(2rh + r^2)$ or $r(2\pi h + \pi r)$
(d) (i)	2 : 3	1	
	2 : 3	1	Accept 1 : 1.5 or $\dfrac{2}{3}$: 1
(ii)	Similar	1	
4 (a)	5 bars correct heights and equal widths	2	**B1** for 4 bars correct height and equal widths or 5 bars of correct height
(b)	2010	1	
(c) (i)	2180	1	
(ii)	2040	2	**B1** for ordering at least 4 or identifying the middle two
(iii)	1970	2	**M1** for $(920 + 1070 + 3100 + 2240 + 2650 + 1840) \div 6$ or 11820 ÷ 6

Question			Answer	Mark	Part marks
5	(a)	(i)	−4 −16 8 1	2	**B1** for 3 correct
		(ii)	Completely correct curve	4	**B3FT** for 9 or 10 correctly plotted **B2FT** for 7 or 8 correctly plotted **B1FT** for 5 or 6 correctly plotted
	(b)		2	1	
	(c)	(i)	Ruled line $y = x$ drawn	1	Must at least intersect the graph in two places
		(ii)	$y = x$ oe	1	
	(d)		Continuous ruled line $y = 7$ drawn	1	Must intersect the graph
			2.1 to 2.5	1FT	
6	(a)	(i)	57	1	
		(ii)	48	1	
		(iii)	50	1	
		(iv)	53	1	
		(v)	63	1	
		(vi)	64	1	
		(vii)	49	1	
		(viii)	Any three from 41 43 47 53 59 61 67	2	**B1** for 2 correct and at most one error
	(b)		$2 \times 3^2 \times 13$ or $2 \times 3 \times 3 \times 13$	2	**B1** for 2, 3 and 13 only identified as factors or for a correct product eg $2 \times 9 \times 13$, 18×13
	(c)	(i)	3^{11}	1	
		(ii)	177 147	1	
		(iii)	$1.77[147] \times 10^5$	1FT	follow through *their* (c)(ii)
	(d)	(i)	$\dfrac{1}{9}$	1	
		(ii)	3	1	

Question	Answer	Mark	Part marks
7 **(a)**	48 to 52	**1**	
(b) **(i)**	Correct ruled angle bisector with 2 pairs of correct arcs	**2**	**B1** for accurate with no / one pair of arcs or **M1** for 2 pairs of correct arcs with no / wrong line
(ii)	270 to 278	**2FT**	**B1** for 13.5 $\pm$ 0.2 [cm] seen in working or **B1FT** for *their* line from E $\pm$ 0.2cm to outside
(iii)(a)	$9 \times 1000 \div (60 \times 60)$	**1**	
(iii)(b)	108 to 111.2	**2FT**	**M1FT** for *their* (b)(ii) $\div$ 2.5
(c)	Correct ruled perpendicular bisector of *DE* with 2 pairs of arcs	**2**	**B1** for accurate with no / one pair of arcs or **M1** for correct intersecting arcs with no / wrong line
(d) **(i)**	Arc centre *A*, radius 7.5 from *AB* to *AE*	**2**	**B1** for centre *A*, incorrect radius or correct arc too short
(ii)	Correct region shaded	**1FT**	follow through provided an area is possible
8 **(a)**	Isosceles	**1**	
(b) **(i)**	73	**1**	
(ii)	15	**1FT**	FT is $180 – (73 + 19 + their$ (b)(i))
(iii)	90	**1**	
(iv)	19	**1**	
(v)	71	**2**	**M1** for [angle *CAF* =] 90 – 19 or **B1** for angle *CAF* = 90° soi
(c)	40.8 **cao**	**3**	**B2** for 40.84….. or **M1** for 13π oe seen in the working **B1 independent** for rounding their circumference correctly if to more than 1 d p

Question	Answer	Mark	Part marks
9 (a)	Cube	1	
(b) (i)		1	
(ii)	13	1	
	17	1	If 0 scored **SC1** for second number 4 more than the first
(iii)	$4n - 3$ oe final answer	2	**B1** for $4n - j$ or $kn - 3$ ($k \neq 0$)
(iv)	73	1FT	follow through linear expressions in (b)(iii)
(v)(a)	25	2	**B1FT** for *their* (b)(iii) = 98 or **B1** for 25.25
(v)(b)	1	1FT	follow through *their* (b)(v)(a) if an integer

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