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MATHEMATICS **0580/33**

Paper 3 (Core) **May/June 2017**

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	Marks	Part marks
1(a)	40	**2**	**M1** for $\frac{360}{72}\times 8$ oe
1(b)	14	**2**	**M1** for $\frac{126}{72}\times 8$ oe or $\frac{126}{360}\times \textit{their}\ 40$ oe
1(c)	Correct ruled line drawn	**2**	**M1** for $\frac{162}{3}[=54]$ or $\frac{162}{3}\times 2[=108]$ or $(\textit{their}\ 40-8-\textit{their}\ 14)\div 3\times\frac{72}{8}[\times 2]$
1(d)	Vanilla	**1FT**	**FT** from their pie chart
2(a)	12 756 000	**1**	
2(b)	160	**2**	**M1** for $\frac{384000}{100}$
2(c)	1.496×10^8	**2**	**M1** for 1.496×10^k or 149 600 000 oe If zero scored, **SC1** for 1.496×10^2 million
2(d)(i)	0.0001	**1**	
2(d)(ii)	0.1 oe	**1**	
3(a)(i)	25	**3**	**M2** for $\frac{510-(6\times 18+8\times 20)}{22}$ soi or **M1** for $6\times 18+8\times 20$ soi
3(a)(ii)	357	**1**	
3(b)	3.8[0]	**2**	**M1** for $2 \times 7.95 + 2 \times 5.95$ or better
3(c)	16 11 or 4.11 pm	**2**	**M1** for conversion to 1 hour and 56 mins or a complete correct method
3(d)	Complete correct method	**M2**	**M2** for 2.28… or 2.29, 2.3, 2.33… [c/g] oe or 43.75, 43.47… or 43.48, 42.85… or 42.86 [g/$] oe or **M1** for one correct calculation
	small	**A1**	

Question	Answer	Marks	Part marks
4(a)	328	**1**	
4(b)	68	**1**	
	corresponding	**1**	
4(c)	72	**1**	
	108	**1FT**	**FT** is 180 – *their c*
	72	**1FT**	**FT** is *their c*
4(d)	165	**3**	**M2** for $180-\frac{360}{24}$ or $(180\times(24-2)\div 24)$ or better or **M1** for $\frac{360}{24}$ or $180\times(24-2)$ or better
4(e)	Correct distance *XY*	**1**	
	Correct bearing	**1**	
4(e)(ii)	Rhombus	**1**	
4(e)(ii)	Kite	**1**	
5(a)(i)	7 : 8 : 9	**2**	**M1** for 35 : 40 : 45 oe If zero scored, **SC1** for 7,8,9 in wrong order
5(a)(ii)	300 225 75	**3**	**M1** for $\frac{600}{(4+3+1)}$ or better and **A1** for one correct answer in the correct place or for two correct answers not in the correct place
5(b)(i)	$\pi\times10^2\times5$	**M1**	
	1570 to 1571	**A1**	
5(b)(ii)	20	**2**	**M1** for $1600=4\times l^2$ or better
5(c)	1330	**1**	
	1350	**1**	**SC1** for correct but answers reversed
5(d)(i)	430	**2**	**M1** for 1290×4 or for recognising that 1290 is 3 pieces
5(d)(ii)	21.5	**1FT**	**1FT** is $\frac{\textit{their}(\mathbf{d})(\mathbf{i})}{2000}\times100$

Question	Answer	Marks	Part marks
6(a)(i)	10, 0, −8, 10	**2**	**B1** for 2 or 3 correct
6(a)(ii)	Completely correct curve	**4**	**B3FT** for 6 or 7 correctly plotted points **B2FT** for 4 or 5 correctly plotted points **B1FT** for 2 or 3 correctly plotted points
6(b)(i)	Ruled continuous line $y = 5$	**1**	
6(b)(ii)	3.5	**1FT**	**FT** *their* graph
	–1.5	**1FT**	**FT** *their* graph
6(c)	–9 is below –8 oe	**1**	
6(d)(i)	$x = 1$	**1**	
6(d)(ii)	–5	**1**	
7(a)(i)	20	**1**	
7(a)(ii)	11 55	**1**	
7(a)(iii)	$26\frac{2}{3}$ or 26.7 or 26.66 to 26.67	**2**	**M1** for 96×1000 or $\frac{96}{3600}$ oe or **B1** for figs 267 or better
7(b)	Ruled horizontal line from (12 20, 16) to (12 35,16)	**1**	
	Ruled line from (*their* 12 35, 16) to (*their* 12 35+15, 0)	**2**	**M1** for $\frac{16}{64}[\times 60]$
7(c)(i)	Ruled line from (11 15, 0) to (12 30, 32)	**1**	
7(c)(ii)	12 09	**1FT**	**FT** *their* graph
7(c)(iii)	9	**1FT**	**FT** *their* graph
7(d)(i)	0.6 oe	**1**	
7(d)(ii)	34	**1**	
7(e)(i)	39	**2**	**B1** for 32 or 7 and 8 seen

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Question	Answer	Marks	Part marks
7(e)(ii)	715.5[0]	**3**	**M2** for (*their* **e(i)** – 3) × 18 + 3 × 18 × 1.25 oe or **M1** for (*their* **e(i)** – 3) × 18 or [3] × 18 × 1.25 or [3] × 18 × 0.25 oe
8(a)	trapezium	**1**	
8(b)(i)	4	**2**	**B1** for 7 cm seen
8(b)(ii)	1120 nfww	**3**	**B1** for 8 [cm] and 12 [cm] seen or 8 × *their* **(b)(i)** [m] or 12 × *their* **(b)(i)** [m] evaluated **M1** for $\frac{(their8 + their12)}{2} \times their7$ or $\frac{(their32 + their48)}{2} \times 28$ oe
8(c)	correct perpendicular bisector drawn with 2 pairs of arcs and extending across field to side *BC*	**2**	**B1** for correct bisector drawn without arcs or wrong arcs or correct short line with arcs or for two pairs of correct arcs
	correct angle bisector drawn with 2 pairs of arcs and extending across field to side *AD*	**2**	**B1** for correct bisector drawn without arcs or wrong arcs or correct short line with arcs or for two pairs of correct arcs
8(d)(i)	Accurately drawn and correct region shaded	**3**	**B1** for 4 cm length seen or implied **B1** one arc drawn centre *A* and touching *AB* and *AD* **B1** correct shading Maximum **B2**
8(d)(ii)	201 nfww or 201.06 to 201.09	**2**	**M1** for π × 16^2 or π × *their radius*^{2} or better
9(a)(i)	Reflection	**1**	
	$x = 1$ oe	**1**	
9(a)(ii)	Translation	**1**	
	$\begin{pmatrix} -10 \\ -5 \end{pmatrix}$	**1**	
9(b)(i)	Correct rotation	**2**	**SC1** for correct rotation, wrong centre or 90° clockwise rotation about (4, 5)
9(b)(ii)	Correct enlargement	**2**	**SC1** for correct enlargement, wrong centre

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