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MATHEMATICS **0580/33**

Paper 3 (Core) **October/November 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	Partial marks
1(a)(i)	800	**1**	
1(a)(ii)	48	**2**	**M1** for $\frac{160}{2+5+3}$ [× 3]
1(a)(iii)	60	**1**	
1(b)(i)	43.5[0]	**2**	**M1** for 3 × 7.5[0] + 2 × 10.5[0]
1(b)(ii)	7.6[0]	**2**	**M1** for $9.5\left(1-\frac{20}{100}\right)$ oe
1(c)(i)	102 138	**2**	**M1** for $\frac{85}{300}\times360$ or $\frac{115}{300}\times360$ or $\frac{120}{100}\times85$ or $\frac{120}{100}\times115$ oe
1(c)(ii)	3 correct sectors	**2FT**	**FT** if *their* angles add to 240° **B1FT** for one correct sector
1(d)	40	**3**	**M2** for $\frac{31.50-22.50}{22.50}\times100$ or $\left(\frac{31.50}{22.50}-1\right)\times100$ oe or **M1** for $\frac{31.50-22.50}{22.50}$ or $\frac{31.50}{22.50}-1$ or $\frac{31.50}{22.50}\times100$ oe
2(a)(i)	9	**1**	
2(a)(ii)	4	**1**	
2(b)(i)	1.4	**1**	
2(b)(ii)	4096	**1**	
2(c)	[0].043 cao	**2**	**M1** for 0.0426… or $\frac{367}{8610}$

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Question	Answer	Marks	Partial marks
2(d)	64.8	**2**	**M1** for $\frac{1}{3}\times 4.5^2 \times 9.6$ or $\frac{324}{5}$
2(e)	$\sqrt{5}$ indicated	**1**	
2(f)(i)	300	**1**	
2(f)(ii)	$2^4 \times 5$ or $2 \times 2 \times 2 \times 2 \times 5$	**2**	**M1** for 2, 2, 2, 2, 5 or 2^4,5 or $1 \times 2 \times 2 \times 2 \times 2 \times 5$ or $1 \times 2^4 \times 5$
2(f)(iii)	20	**2**	**B1** for 2 or 4 or 5 or 10 as answer or $2^2 \times 5$ as answer
3(a)(i)	Chord	**1**	
3(a)(ii)	Tangent	**1**	
3(b)(i)	48	**1**	
3(b)(ii)	66	**2**	**M1** for 180 – 48 soi by 132
3(b)(iii)	42	**2FT**	**2FT** for 90 – *their* **(b)(i)** or **B1** for angle *OCQ* = 90 soi
4(a)	Scalene	**1**	
4(b)	Translation	**1**	
	$\begin{pmatrix}-5\\-4\end{pmatrix}$	**1**	
4(c)	Correct rotation Vertices (2, –1), (2, –4), (3, –2)	**2**	**B1** for correct orientation but wrong position or for rotation of 90° anticlockwise about origin
4(d)(i)	1.5 oe	**1**	
4(d)(ii)	Correct enlargement Vertices (1, 3), (3, 5), (7, 3)	**2**	**B1** for correct size and orientation, incorrect position
4(d)(iii)	4	**2**	**M1** for $\frac{1}{2}\times 6 \times 2$ soi by 6 or correct method to find area of *their* triangle

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Question	Answer	Marks	Partial marks
5(a)(i)	$n + 10$	**1**	
5(a)(ii)	$2(n + 10)$ oe isw	**1FT**	
5(a)(iii)	*their* **(ii)** = 52	**M1**	
	16 final answer	**B2**	**M1** for $2n = 52 - 20$ or $n = 26 - 10$ or better
5(a)(iv)	42	**1FT**	**FT** 2 × *their* **(iii)** + 10
5(b)(i)	$\frac{1}{4}$ cao	**2**	**B1** for $\frac{13}{52}$ oe soi
5(b)(ii)	Correct arrow at $\frac{3}{4}$	**1**	
5(c)	2.7[00]	**2**	**B1** for answer figs 27 or for 0.45 seen
5(d)	115 125	**2**	**B1** for one correct or both values correct but reversed
6(a)(i)	4.5	**2**	**M1** for ordered list of at least 6 values or **B1** for 4.3 **and** 4.7 both identified
6(a)(ii)	8	**1**	
6(a)(iii)	5.18	**2**	**M1** for sum of 10 distances ÷ 10
6(b)(i)	15 50 or 3.50 pm	**2**	**M1** for 9 ÷ 6 or 1.5 hours oe seen
6(b)(ii)	100	**2**	**M1** for 6 × 1000 or 6 ÷ 60 soi
6(c)(i)	Positive	**1**	
6(c)(ii)	Point (4, 68) indicated	**1**	
7(a)(i)	–3 –6 6 3	**2**	**B1** for 2 or 3 values correct
7(a)(ii)	Correct curve	**4**	**B3FT** for 7 or 8 correctly plotted points or **B2FT** for 5 or 6 correctly plotted points or **B1FT** for 3 or 4 correctly plotted points
7(a)(iii)	Ruled line $y = -5$	**1**	
7(a)(iv)	–2.5 to –2.3	**1FT**	**FT** intersection of *their* line with *their* curve

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Question	Answer	Marks	Partial marks
7(b)(i)	–0.5 oe	**2**	**M1** for $\frac{\text{rise}}{\text{run}}$
7(b)(ii)	$y = –0.5x + 2$ oe	**1FT**	**FT** *their* gradient
7(b)(iii)	$y = –0.5x + 3$ oe	**2FT**	**B1FT** for $y = –0.5x + k$ oe, $k \neq 2$ or **B1** for $y = mx + 3$ oe, $m \neq –0.5$ or 0
8(a)(i)	Correct trapezium	**2**	**M1** for $AB = 8$ cm and $BC = 6$ cm or AB and DC perpendicular to AD
8(a)(ii)	124	**1FT**	**FT** *their* obtuse angle at C (or B)
8(a)(iii)	4.7	**1FT**	**FT** *their CD*
8(a)(iv)	31.25 to 32.25	**2**	**M1** for $0.5 \times 5 \times (8 +$ *their* **(iii)**$)$ oe
8(b)(i)	17 700 or 17 671 to 17 674	**3**	**M2** for $\pi \times 15^2 \times 25$ or **B1** for 15 seen If zero scored, **SC1** for answer 70 700 or 70 685 to 70 695 or $22\,500\pi$
8(b)(ii)	4800	**3**	**M2** for $2 \times 30 \times 30 + 4 \times 30 \times 25$ oe or better or **M1** for 30×30 and 30×25 or **B1** for cuboid 30 by 30 by 25 soi
9(a)	$y(y + 8)$ final answer	**1**	
9(b)	$2x + 17$ final answer	**2**	**B1** for $6x – 3$ or $–4x + 20$ or $2x + j$ or $kx + 17$ as final answer
9(c)	$\frac{k – 5m}{7}$ oe final answer	**2**	**M1** for $7p = k – 5m$ or $\frac{k}{7} = \frac{5m}{7} + p$
9(d)	Correctly equating one set of coefficients	**M1**	
	Correct method to eliminate one variable	**M1**	Dependent on the coefficients being the same for one of the variables. Correct consistent use of addition or subtraction using their equations.
	$x = 4$	**A1**	
	$y = –3$	**A1**	If zero scored, **SC1** if no working shown, but 2 correct answers given or **SC1** for 2 values satisfying one of the original equations.

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