



MATHEMATICS

0580/33

Paper 3 (Core)

May/June 2017

MARK SCHEME

Maximum Mark: 104

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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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 $\frac{126}{360} \times \text{their } 40$ oe
1(c)	Correct ruled line drawn	2	M1 for $\frac{162}{3} [= 54]$ or $\frac{162}{3} \times 2 [= 108]$ or $(\text{their } 40 - 8 - \text{their } 14) \div 3 \times \frac{72}{8} [\times 2]$
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 – <i>their c</i>
	72	1FT	FT is <i>their c</i>
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 <i>XY</i>	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)	$\pi \times 10^2 \times 5$	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 $\frac{\text{their(d)(i)}}{2000} \times 100$

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 <i>their</i> graph
	-1.5	1FT	FT <i>their</i> 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 (<i>their</i> 12 35, 16) to (<i>their</i> 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 <i>their</i> graph
7(c)(iii)	9	1FT	FT <i>their</i> 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

Question	Answer	Marks	Part marks
7(e)(ii)	715.5[0]	3	M2 for $(\text{their } e(i) - 3) \times 18 + 3 \times 18 \times 1.25$ oe or M1 for $(\text{their } e(i) - 3) \times 18$ or $[3] \times 18 \times 1.25$ or $[3] \times 18 \times 0.25$ oe
8(a)	trapezium	1	
8(b)(i)	4	2	B1 for 7 cm seen
8(b)(ii)	1120 nfw	3	B1 for 8 [cm] and 12 [cm] seen or $8 \times \text{their } (b)(i)$ [m] or $12 \times \text{their } (b)(i)$ [m] evaluated M1 for $\frac{(\text{their}8 + \text{their}12)}{2} \times \text{their}7$ or $\frac{(\text{their}32 + \text{their}48)}{2} \times 28$ oe
8(c)	correct perpendicular bisector drawn with 2 pairs of arcs and extending across field to side <i>BC</i>	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 <i>AD</i>	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 <i>A</i> and touching <i>AB</i> and <i>AD</i> B1 correct shading Maximum B2
8(d)(ii)	201 nfw or 201.06 to 201.09	2	M1 for $\pi \times 16^2$ or $\pi \times \text{their radius}^2$ 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