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Cambridge International General Certificate of Secondary Education

MARK SCHEME for the March 2016 series

0580 MATHEMATICS

0580/32

Paper 32 (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
nfw	not from wrong working
soi	seen or implied

Question	Answer	Mark	Part marks
1 (a)	1092	1	
(b) (i)	$\frac{1}{12}$ cao	2	M1 for $\frac{2}{24}$ or $\frac{120}{1440}$ oe
(ii)	$\frac{11}{12}$ oe	1FT	FT is for 1 – <i>their</i> $\frac{1}{12}$
(c)	428.5 429.5	1 1	SC1 for both answers correct but reversed
2 (a) (i)	rotation [centre] (6, 7) 180° oe	1 1 1	or enlargement SF = –1 centre (6, 7)
(ii)	reflection $x = 1$	1 1	
(iii)	enlargement [centre] (6, 11) scale factor 2	1 1 1	
(b)	correct translation shown	2	B1 for translation by $\begin{pmatrix} -3 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ 2 \end{pmatrix}$
3 (a)	$\frac{2}{10}$ oe	1	
(b) (i)	4 points correctly plotted	2	B1 for 3 correct points
(ii)	positive	1	
(iii)	correct ruled line	1	
(iv)	46 to 48	1FT	strict FT from their line if positive
(v)	10 is not in range of recorded test 1 results	1	

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Question	Answer	Mark	Part marks
4 (a) (i)	9 : 4	1	
(ii)	7	2	M1 for $\frac{3}{5} \times 45$ or $45 : 3 \times 9$
(b) (i)	4218.24 cao	3	M2 for 3750×1.04^3 oe or M1 for 3750×1.04^2 oe If zero scored SC2 for 468.24
(ii)	33	2FT	M1FT for <i>their</i> $\frac{4218.24}{126}$
	60.24	2FT	M1FT for <i>their</i> $4218.24 - 126 \times \text{their } 33$ or $(\text{their } \frac{4218.24}{126} - \text{their } 33) \times 126$
(c)	17.28	1	
(d) (i)	1.85	3	M1 for $0 \times 1 + 1 \times 4 + 2 \times 12 + 3 \times 3$ M1dep for $\frac{\text{their } 37}{20}$
(ii)	1 1 18 [0]	2	B1 for 1 answer correct and total number of sheep = 20 or 18
(iii)	Same total number of sheep and same total number of lambs oe	1	
5 (a)	constant cross-sectional area oe	1	
(b)	$[AB^2] + 4^2 = 5^2$	M1	
	$[AB] = \sqrt{5^2 - 4^2} = \sqrt{9}$	M1	
(c)	42	3	M2 for $\frac{3 \times 4}{2} \times 7$ or M1 for $\frac{3 \times 4}{2}$ If zero scored SC1 for answer 84
	cm ³	1	B1 independent
(d)	correct net drawn	3	M1 for 7×4 rectangle drawn in correct place M1 for one 3,4,5 triangle drawn correctly

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Question	Answer	Mark	Part marks
(e)	96	2	M1FT for $5 \times 7 + 4 \times 7 + 3 \times 7$ oe or $2 \times \frac{1}{2} \times 3 \times 4$ or FT their net
6 (a)	shop	1	
(b)	[graph] steepest oe	1	
(c) (i)	0.2×20 or $12 \times \frac{1}{3}$ oe	M2	M1 for 12×20
(ii)	distance axis numbered correctly with at least 2 more numbers	1	
(d)	12	2	M1 for $\frac{3}{0.25}$ or $\frac{3}{15} \times [60]$
(e)	ruled line from (1034, 8) to (1058, 0)	1	
(f)	16.6 or 16.55...	3	M2 for $\frac{\text{their swimming pool distance} \times 2}{\text{their } 1058 - 1000} \times 60$ or M1 for a $\frac{\text{dist}}{\text{time interval}}$
(g) (i)	182.2	3	M1 for $2\pi \times 29$ A1 for 182.2 to 182.24 A1FT for their A1 rounded correctly to 1dp
(ii)	274	2FT	M1FT $\frac{50000}{\text{their}(g)(i)}$ or $\frac{500}{\text{their}(g)(i) \div 100}$ If zero scored SC1 for figs 27[44...]
7 (a) (i)	34	2	M1 for $\frac{1732}{52}$
(ii)	3.90	3FT	M1FT for $\frac{198 \times \text{their } 34}{1732}$ A1FT 3.88 to 3.89 A1FT their answer rounded to nearest 10c
(b) (i)	3.9	2	M1 for 7.8 If zero scored SC1 for figs 38 to 40
(ii)	football ground indicated in correct position	3	B1 for bearing of 105° from A B1 for bearing of 068° from M B1FT for indication of the football ground's position, dpt on at least one B1

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Question	Answer	Mark	Part marks
(c) (i)	24	1	
(ii)	$3w + 4d = 29$	2	B1 for $3w + 4d$ seen
(iii)	$[w] 7$ $[d] 2$	4	M1FT for correctly equating one set of coefficients M1FT for correct method to eliminate one variable A1 for $w = 7$ A1 for $d = 2$ If zero scored, SC1 for either: 2 correct answers given or 2 values satisfying one of their original equations
(iv)	38	1FT	FT is $4 \times \text{their } 7 + 5 \times \text{their } 2$
8 (a)	correct perpendicular bisector drawn with 2 pairs of arcs	2	B1 for correct bisector drawn without arcs or 2 pairs of correct arcs drawn
(b) (i)	correct angle bisector drawn with 2 pairs of arcs	2	B1 for correct bisector drawn without arcs or 2 pairs of correct arcs drawn
(ii)	correct region shaded	1	dependent on a line drawn from A to BC
(c)	correct loci drawn	3	B1 two 4 cm arcs drawn centres M and N B1 two straight lines drawn parallel to MN and 4 cm from MN , one on each side of MN B1 completely correct loci drawn within tolerance throughout
9 (a)	(9), 3, (−1), −3, −3, −1, 3, 9	3	B2 for any 5 correct or B1 for any 3 or 4 correct
(b)	completely correct curve	4	B3FT for 7 or 8 correct plots B2FT for 5 or 6 correct plots B1FT for 3 or 4 correct plots
(c)	(1.5, k) where $-3.5 \leq k < -3$	1	
(d) (i)	ruled line $x = 1.5$ drawn	1	
(ii)	$x = 1.5$ oe	1	