CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0581 MATHEMATICS

0581/32   Paper 3 (Core), maximum raw mark 104

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.	Answers	Mark	Part Marks
1 (a)	$4 \times 1000 \times 1000$ or 4×1000^2	1	
(b)	$0.95 \times 4\,000\,000$ oe	1	
(c) (i)	$3 \div 19 \times 3\,800\,000$	2	**M1** for $3 \div (11 + 5 + 3)$ or $3\,800\,000 \div (11 + 5 + 3)$
(ii)	$2\,200\,000$	1	
(iii)	$15\,710$	2FT	**M1FT** for *their* $2\,200\,000 \div 140$
(d) (i)	$1 - \left(\dfrac{24}{40} + \dfrac{5}{40} \right)$	M2	**M1** for $\dfrac{24}{40}$ *or* $\dfrac{5}{40}$ *or* $\dfrac{3 \times 8}{5 \times 8}$ *or* $\dfrac{1 \times 5}{8 \times 5}$
	$\dfrac{11}{40}$ or $\dfrac{11k}{40k}$ final answer	A1	If zero scored, **SC3** for $1 - (0.6 + 0.125) = 0.275 = \dfrac{275}{1000} = $ $[\dfrac{11}{40}$ or $\dfrac{11k}{40k}]$ or **SC2** for $1 - (0.6 + 0.125) = 0.275 = \dfrac{275}{1000}$ followed by incorrect fraction **SC1** for $\dfrac{11}{40}$ or $\dfrac{11k}{40k}$ final answer
(ii)	$165\,000$	1FT	**FT** *their* **(d)(i)** $\times 600\,000$
(e)	$281\,216$ cao	3	**M2** for $250\,000 \times 1.04^3$ oe or **M1** for $250\,000 \times 1.04^2$ oe If zero scored, **SC1** for $31\,216$

2	(a)		Octagon	1	
	(b)		135	3	**M2** for 180 – (360 ÷ 8) or **M2** for $\dfrac{(8-2)\times 180}{8}$ or **M1** for (360 ÷ 8) or **M1** for (8 – 2) × 180
	(c)	(i)	22 29 36	2	**B1** for two terms in correct places or 2 terms with a difference of 7.
		(ii)	$7n + 1$ oe	2	**B1** for $7n + j$ or $kn + 1$ ($k \neq 0$)
		(iii)	71	1FT	**FT** for *their* **(c)(ii)** if linear
		(iv)	13 **nfww**	2	**M1FT** for *their* **(c)(ii)** = 92 or **M1** for (92 – 1) ÷ 7 or 91 ÷ 7 or **M1** for 7 × 13 + 1 = 92
3	(a)		Reflection [in] *AB*	1 1	
			Rotation 180° oe Midpoint of *AB* oe	1 1 1	
	(b)	(i)	Translation 2 left and 7 up	2	**SC1** for one of 7 up or 2 left
		(ii)	Correct Enlargement	2	**SC1** for enlargement scale factor 3 but incorrectly placed
	(c)		Correct line of symmetry	1FT	**FT** is *their* **(b)(ii)**
4	(a)	(i)	Line (0700, 0) to (08 40, 310) Horizontal line 2 squares Line *their* (08 50, 310) to (09 40, 470)	1 1FT 1FT	Lines need not be ruled and could be curves with positive gradients throughout.
		(ii)	2[h]40[min]	1	
		(iii)	176.25	2	**M1FT** for 470 ÷ *their* **(a)(ii)**
	(b)	(i)	2[h]21[min]	2	**M1** for 470 ÷ 200 soi
		(ii)	Line from (07 45, 470) to (*their* 10 06, 0)	2FT	**B1** for (07 45, 470) correctly plotted or **B1FT** for (*their* 10 06, 0) correctly plotted
	(c)		290 to 300	1FT	(Correct or follow through) **FT** from intersection on *their* graph.

5	(a)	(i)	Trapezium	1	
		(ii)	Pentagon	1	
	(b)	(i)	$[BC =] \sqrt{52^2 - 20^2}$ $[= 48]$	**B2**	**B1** for $52^2 = BC^2 + (70 - 50)^2$ or $52^2 = BC^2 + 20^2$ or $BC^2 = 52^2 - 20^2$
		(ii)	3936 or 3940	**2**	**M1** for $(70 + 12) \times 48$ oe
	(c)	(i)	220	1	
		(ii)	2880	**2**	**M1** for $0.5(50 + 70) \times 48$ oe
	(d)		108	**3**	**B1** for $[AE=]$ 24 **M1** for $0.5 \times$ *their AE* $\times 9$
	(e)		948	**1FT**	**FT** *their* **(b)(ii)** – (*their* **(c)(ii)** + *their* **(d)**)
6	(a)	(i)	–5 –8 5 2.5	**2**	**B1** for 3 correct
		(ii)	8 points correctly plotted Correct curve	**B3FT** 1	**B2FT** for 6 or 7 correct points **B1FT** for 4 or 5 correct points
		(iii)	Ruled line $y = 6$ drawn 3.1 to 3.6	1 1	Independent marks
	(b)	(i)	–5 –1 3	**2**	**B1** for 2 correct
		(ii)	Ruled correct line	1	
		(iii)	$\frac{1}{2}$ oe	1	
	(c)		7.2 to 7.6 –5.2 to –5.6	**1FT** **1FT**	
7	(a)	(i)	15.5	**2**	**M1** Sum of the 10 items of data $\div$ 10
		(ii)	16	**2**	**M1** for ordering at least first or last 6 items or for 14 **and** 18 indicated
		(iii)	26	1	
	(b)	(i)	6 correct bars	**2**	**B1** for 4 or 5 correct bars or 6 correct heights
		(ii)	Aug[ust]	1	
		(iii)	$\frac{4}{12}$ oe	1	

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8	(a)	(i)	[0]63 to [0]67	1	
		(ii)	8	2	**B1** for 6 ± 0.2 [cm] seen in working
	(b)		QR on bearing 123° to 127°	1	**B1** for bearing of 123° to 127°
			9.3 cm to 9.7 cm continuous ruled line	2FT	**M1FT** for $76 \div$ *their* **(a)(ii)** soi by calculation or distance on diagram
	(c)	(i)	297 – 270 or 90 – (360 – 297)	1	
		(ii)	7.6 **cao nfww**	3	**M1** for $\cos27° = \dfrac{PW}{8.5}$ or $\sin63° = \dfrac{PW}{8.5}$ or better **A1** for 7.57(...) **B1ind** for correctly rounding *their* 7.57(...) to 2 sig figs if *their* 7.57(…) is to 3 sig figs or more
	(d)		Correct continuous perpendicular bisector of AB with two pairs of correct arcs	2	**B1** for correct continuous bisector without arc or with incorrect arcs
9	(a)	(i)	338.4[0]	3	**M2** for $5 \times 36 + 660 \times 0.24$ or better or **M1** for 5×36 or 660×0.24 or better
		(ii)	389.16	2FT	**M1FT** for $1.15 \times$ *their* **(a)(i)** oe
	(b)	(i)	60	1	
		(ii)	108	1FT	$1.8 \times$ *their* **(b)(i)**
		(iii)	497.16	1FT	**FT** *their* **(a)(ii)** + *their* **(b)(ii)**
	(c)		31 **nfww**	2FT	**M1FT** for $\dfrac{their\,\textbf{(b)(iii)}}{1600} \times 100$