CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0581 MATHEMATICS

0581/31 Paper 2 – 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

Qu.	Answers	Mark	Part Marks
1 (a) (i)	540 ÷ 9 *their* 60 × (9 + 7 + 4 + 5) 1500 ÷ 1000	**M1** **M1FT** **A1**	Alternative method **M1** 540 ÷ 1000 **M1FT** *their* 0.54 ÷ 9 **A1** 0.06 × (9 + 7 + 4 + 5) If 0 scored **SC1** for 0.54 + 0.42 + 0.24 + 0.3
(ii)	300	**2**	**M1** for 5 ÷ (9 + 7 + 4 + 5) × 1500 or (540/9) × 5 or 60 × 5
(iii)	210	**2FT**	**M1** for 70 ÷ 100 × *their* **(a)(ii)** oe
(b) (i)	2.25	**1**	
(ii)	52.6[0]	**2**	**B1** for 14 or (7/8) × 16 × 3.4[0]
(iii)	46.1	**3FT**	**M2** for (*their* **(b)(ii)** – 36) ÷ 36 × 100 or **M1** for *their* **(b)(ii)** – 36 **M2** for *their* **(b)(ii)** ÷ 36 × 100 – 100 **M1** for *their* **(b)(ii)** ÷ 36 [× 100]
2 (a) (i)	Trapezium	**1**	
(ii)	16 cm^2	**2** **1**	**M1** for ½(2 + 6) × 4 oe
(b)	Rotation 90°[anti-clockwise] oe [centre] (–2, –8)	**B1** **B1** **B1**	Independent marks
(c) (i)	Correct reflection in $y = 0$	**2**	**SC1** for correct reflection in $x = 0$
(ii)	Translation 5 left and 7 up	**2**	**SC1** for one of 5 left or 7 up

	(iii)	Correct Enlargement	**2**	**SC1** for enlargement, SF ½, but incorrectly placed.
	(d)	Obtuse angle marked	**1**	
3	**(a) (i)**	4 points correctly plotted.	**2**	**B1** for 1 correct
	(ii)	Correct continuous ruled line of best fit.	**1**	Dependent on at least 8 points on graph
	(iii)	Distance on their line of best fit.	**1FT**	**FT** *their* single straight line in part **(ii)**.
	(iv)	Negative	**1**	
	(v)	Faster the time, the longer the distance oe	**1**	
	(b) (i)	11.7 or 11.69... NFWW	**2**	**M1** for Attempt at $\sum f \div 12$
	(ii)	41.7 or 41.66 to 41.67	**2**	**B1** for $\frac{5}{12}$ seen
	(iii)	2.45	**1**	
4	**(a)**	$x + x + 180 = 480$ $2x = 300$	**M1** **M1**	
	(b)	1060 [cm]	**2**	**M1** for $2 \times 480 + 2 \times (20 + 30)$ oe
	(c) (i)	16 500	**2**	**M1** for $30 \times 150 + 50 \times 180 + 20 \times 150$ oe
	(ii)	2 805 000	**1FT**	**FT** their **(c)(i)** $\times$ 170
	(iii)	44.9 or 44-88	**2FT**	**FT** their **(c)(ii)** $\div 100^3 \times 16$ **M1** for their **(c)(ii)** $\times$ 16

5	**(a)**	6 003 076	**1**	
	(b) (i)	–0.375	**1**	
	(ii)	–2.2	**1**	
	(iii)	>	**1FT**	**FT** their answers to **(i)** and **(ii)**
	(c)	3945, 3955	**1, 1**	**SC1** for both correct but reversed
	(d)	1.667 cao	**2**	**B1** for $1\frac{2}{3}$ or better
	(e) (i)	1	**1**	
	(ii)	$\frac{1}{125}$	**1**	
	(iii)	$24x^9$	**2**	**B1** for $24x^k$ or kx^9
6	**(a) (i)**	4, 7, 4	**2**	**B1** for 2 correct
	(ii)	7 points correctly plotted	**3FT**	**B2** for 5 or 6 correct **B1** for 3 or 4 correct
		Correct curve through the points	**1**	
	(iii)	$x = 0$	**1**	
	(iv)	2.7 to 2.9, –2.7 to –2.9	**1, 1**	
	(b) (i)	Points correctly plotted and a ruled line through points and beyond them.	**2**	**B1** for 1 correct plot. (even if line is not drawn)
	(ii)	[$y =$] $–2x + 4$	**3**	**B2** for $–2x + j$ or **B1** for $kx + 4$ $k \neq 0$ or [gradient =] $\frac{rise}{run}$ correct values
	(iii)	(–1.2 to –1.4, 6.4 to 6.6)	**1**	
7	**(a)**	106 to 110	**1**	
	(b) (i)	Correct bisector of AB constructed with 2 pairs of arcs.	**2**	**B1** for correct bisector
	(ii)	Correct bisector of angle ABC with arcs	**2**	**B1** for correct bisector without arcs
	(iii)	T marked at intersection of their bisectors	**1FT**	

	(c)	24.4[km] to 26.0[km]	**2FT**	**FT** *their AT* **B1** for *their AT* correctly meas
	(d)	Circle, radius 7.5(±0.2)cm centre *T*.	**2FT**	**FT** *their* intersection **SC1** for circle centre T, incorrect radius.
	(e)	No It is outside the circle. oe	**1FT**	**FT** *their* circle.
8	**(a) (i)**	Correct diagram with scale	**3**	**B1** scale correct. **B1** for all widths the same **B1** for all 6 heights correct
	(ii)	10 to 12 cao	**1**	
	(iii)	$\frac{19}{120}$ or 0.158[3....] or 15.8[3.....]%	**1**	
	(b)	Probability must be between 0 and 1 oe	**1**	
	(c) (i)	$\frac{9}{20}$ or 0.45 or 45%	**1**	
	(ii)	0 oe	**1**	
9	**(a) (i)**	18 23 28	**1, 1, 1**	Allow one mark for each addition of 5 to the previous answer
	(ii)	Add 5 oe	**1**	
	(iii)	$5n - 2$ oe	**2**	**B1** for $5n + j$ or $kn - 2$ $k \neq 0$
	(iv)	73	**1FT**	**FT** *their* **(a)(iii)** if linear.
	(b) (i)	10 14	**1, 1**	Allow 1 mark for addition of 4 on their value for 3rd diagram.
	(ii)	$4n - 2$ oe	**2**	**B1** for $4n + j$ or $kn - 2$ $k \neq 0$