UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

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.

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Abbreviations

cao correct answer only
cso correct solution only
dep dependent
ft follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
www without wrong working
art anything rounding to
soi seen or implied

Qu.	Answers	Mark	Part Marks
1	**(a)** $0.76 \times 1000 = 760$ oe	2	**B1** 0.76×1000 or $1000 - 0.24 \times 1000$
	(b) $\frac{19}{25}$ cao	2	**B1** for $\frac{760}{1000}$ or $\frac{76}{100}$ or $\frac{38}{50}$
	(c) 120	2	**M1** for $6 \times 760 \div (6 + 15 + 17)$ or $6 \div (6 + 15 + 17)$ or $760 \div (6 + 15 + 17)$ or 20
	(d) 23 or art 23.1	3	**M1** for $80 - 65$ (= 15) and **M1** dep for '15' $\div 65 \times 100$
2	**(a) (i)** 2 and 45 or 3 and 30 or 5 and 18 or 6 and 15 or 9 and 10	1	
	(ii) 2, 3, and 5 (ignore 1 if included)	3	**B1** for each correct prime factor –1 for 1 or more non prime factors of 90 given in addition And –1 once if any non factors of 90 are given
	(b) (i) 15 or 19	1	
	(ii) 984	1	
	(iii) 81	1	
	(iv) 8 or 1	1	
	(v) 91	1	
	(vi) 4	1	
	(vii) 109	1	

3	**(a) (i)** 15 50 cao	1	
	(ii) 1.6 (km) cao	1	
	(iii) 14 (mins) cao	1	
	(iv) art 6.86 (km/h)	3ft	**M1** for '1.6' ÷ '14' and **M1ind** for '14' ÷ 60 soi
	(b) (i) (16 04, 4) to (16 10, 4) ('16 10', 4) to ('16 50', 0)	1 2ft	Line must be horizontal **M1** for dealing with the time 4 ÷ 6 × 60 ft for a time period of 40 minutes only
	(ii) 16 50	1ft	ft their time at home
	(c) (i) Straight line from 15 48 to 16 34	2	**B1** for one end correct or both correct and line missing or not straight
	(ii) 16	1ft	ft their time difference on x-axis
4	**(a) (i)** Perpendicular bisector of BC with 2 pairs of arcs	2	**B1** correct without arcs
	(ii) S at midpoint of BC	1	Independent
	(iii) Bisector of angle ABC with two pairs of arcs	2	**B1** correct without arcs
	(iv) R clearly marked	1	ft their **(a)(i)** and **(a)(iii)**
	(v) Q marked on BA	1	ft their marked R and their marked S
	(vi) $BQRS$ drawn	1	ft their Q, R and S
	(b) 829 to 974 cao (if their BQRS is approximately a square)	3	For square or rectangle **M2** their length × their width × 36 or **M1** for their length or width to metres or **M1ind** for their length × their width
	(c) Line from A at 070° Line from C at 345°	1 1	
	(d) Circle radius 4 cm centre their T	2ft	**SC1** for any circle centre their T or **SC1** for any circle radius 4 cm
5	**(a) (i)** (2, 6) and (–3, –4)	2	**B1** for one pair correct
	(ii) (n =) 12 cao	1	
	(b) (i) 2 cao	1	
	(ii) Lines of symmetry drawn	1, 1	
	(iii) $y = x$ oe and $y = –x$ oe cao	1, 1	
	(c) (i) (x =) 3.3 to 3.7 and (x =) –3.3 to –3.7	1ft 1ft	ft their graph
	(ii) Line parallel to line in **(c)(i)** through (0, 4)	1ft	**(c)(i)** line must be linear
	(iii) $y = x + 4$ oe	2ft	**B1** for $y = mx + 4$ ($m \neq 0$) or for $y = x + k$ ($k \neq 0$) **B1**ft for $y = mx$ + '4' ($m \neq 0$) or for $y =$ 'm'$x + k$ ($k \neq 0$)

6	**(a) (i)** 140	2	**M1** for $180 \times (9 - 2) \div 9$ or better
	(ii) $180n - 360$	1	
	(iii) 15	3	**M2** for $360 \div (180 - 156)$ or **M1** for $156n$ = their **(a)(ii)** and **M1dep** for $pn = q$ from their linear expression
	(b) $(x =) -2$, $(y =) 3$	3	**M1** for equating coefficients of x or y and adding or subtracting, allow 1 error **A1** for 1 correct
7	**(a)** Trapezium	1	
	(b) 68.2	3	**M2** for tan = $50 \div (85–65)$ or better **B1** for $85 - 65$ (= 20) seen in working area
	(c) 3750	2	**M1** for $0.5(65 + 85) \times 50$
	(d) 360 000 cm^3	1ft 1	ft their **(c)** × 96, correct to a minimum of 3sf units mark independent
8	**(a) (i)** $150 \div 360 \times 24$ (= 10)	2	**M1** for their '150' ÷ 360 × 24 or **B1** for 150
	(ii) (lost) 8, (drawn) 6	3	**B1** for 120 or 90 seen and **M1** for '120' ÷ 360 × 24 or '90' ÷ 360 × 24
	(b) (i) 5, 7, 6, 3, 2, 1	2	**B1** for 5 correct or 4 correct with total 24 or **SC1** if only tallies seen (all must be correct)
	(ii) 1	1ft	ft their table
	(iii) 1.5	2	**M1** for evidence of attempt at middle value
	(iv) 1.7 or 1.71 or 1.70(8…) cao	3	**M1** for 0 × '5' + 1 × '7' + 2 × '6' + 3 × '3' + 4 × '2' + 5 × '1' and **M1dep** division by 24
9	**(a) (i)** 3.82 art	2	**M1** for $2.7^2 + 2.7^2$ or better or sin 45 = $\frac{27}{BD}$ or better or cos 45 = $\frac{27}{BD}$ or better
	(ii) Isosceles	1	
	(iii) 45 cao	1	
	(b) (i) Diagram 4	1	
	(ii) 10, 13, 16	2	**B1** for 2 correct or difference of 3 seen between diagram 4 and diagram 5 in table
	(c) (i) 28	1	
	(ii) $3n + 1$ oe	2	**B1** for $pn + 1$ ($p \neq 0$) or $3n + q$
	(d) 25	2ft	**M1** for 76 = their **(c)(ii)** (if linear)
	(e) $3n + 2$ oe	1ft	ft their **(c)(ii)** + 1 (must be a linear expression)