UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2010 question paper

for the guidance of teachers

0580 MATHEMATICS

0580/32 Paper 32 (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) (i)	3, 4, 6, 9, 12, 18	2	W1 for 4 or 5 correct and no errors or 6 correct and 1 error.
(ii)	Any two of 3, 6, 9,18	2	W1 for 1 correct and no errors or 2 correct and one extra, incorrect given.
(b)	25, 36, 49	3	–1 each error or omission SC2 for all of 5^2, 6^2, 7^2. SC1 for all of 5, 6, 7
(c)	$p = 2$, $q = 7$	2	W1 for either correct.
2 (a)	12	3	Either M1 for 150 – 132 soi M1 for '18' ÷ 150 × 100 or M1 for 132/150×100 M1 for 100 – '88'
(b)	60	3	M1 for 15 + 7 +11 M1dep for 15 ÷'33' × 132, 132÷'33'×15, 4×15 SC2 for 60:28:44
(c)	$\frac{2}{11}$ cao	2	W1 for $\frac{12}{66}$ or $\frac{8}{44}$ or $\frac{6}{33}$ or $\frac{4}{22}$
(d)	($)162	2	M1 for 108 ÷ 100 × 150 or 150 + (8 ÷ 100 × 150)

3 (a)	32	2	M1 for $8 \div \frac{1}{4}$ or 8×4
(b) (i)	14 15	1	
(ii)	20	2	M1 for $12 \div 36$ or $(12 \div 36) \times k$
(iii)	Horizontal line from 13 45 to '14 15' Line from ('14 15', 8) to ('14 35', 20)	1ft 1ft	
(c) (i)	1(h) 20(min)	2	M1 for $20 \div 15$ Implied by 1.33(3333) seen or 1 (hr) 33 (mins) or 1 1/3
(ii)	Line from 13 30 to '14 50'	1ft	
(iii)	15	1ft	
4 (a)	1st row 7, 8, 6, 7, 5, 4 2nd row 0, 8, 12, 21, 20, 20	1 1ft	Allow 1 error Allow 1 error
(b) (i)	103	1ft	
(ii)	2.575 or 2.58	2	M1 Their **(b)(i)** ÷ 40
(iii)	2 cao	2	M1 clear attempt to find the middle number of goals.
(iv)	1 cao	1	
(c) (i)	5	1	
(ii)	Line on pie chart 108° from either given line and correctly labelled.	2	M1 for (12 or '5') ÷ 40 × 360 oe seen
(d) (i)	$\frac{23}{40}$	1	or 0.575 or 57.5%
(ii)	$\frac{35}{40}$ or $\frac{7}{8}$	1ft	or 0.875 or 87.5%, or $\frac{315}{360}$ ft 1 – their **(c)(i)**/40 oe

5 (a) (i)	art 6.43	2	M1 for 10sin(180 – 140) or 10sin40 or
(ii)	77.1 to 77.2	1ft	Their **(a)(i)** × 12
(b)	8.5	3	W1 for $x + 2 + x + x + 2 + x = 38$ oe M1 for correct first step but must be from a linear equation $ax + b = k$
6 (a) (i)	45	1	
(ii)	8 cao	2	M1 for either 360 ÷ 45 or 360 ÷ their **(a)(i)**
(iii)	(Regular) Octagon	1ft	Only ft for integer in **(a)(ii)**
(b)	(x =) 90 (y =) 26 cao (z =) 116 cao	1 2 2	M1 for 90 – 64 M1 for 180 – 64 or M1 for 90 + 'y' seen with correct working
7 (a)	Point F constructed with arcs. AF = 4 cm EF = 5 cm	2	1 mark if correct without arcs SC1 if F correctly constructed but in pond
(b)	Bisector of CD 4.5 cm, with correct arcs	2	1 mark if correct without arcs
(c)	Bisector of angle BCD with 4 correct arcs	2	1 mark if correct without arcs
(d) (i)	6.8 – 7.3	1ft	ft their LM
(ii)	136 – 146	1ft	ft their **(d)(i)** × 20
(e)	45 × their **(d)(ii)** or 900 × their **(d)(i)**	2dep	Dep on at least 1 or 2 in **(b)** M1 0.5 × 90 × their **(d)(ii)** or 0.5 × 4.5 × their **(d)(i)** or SCM1 for clear attempt at ½ × base × height of their triangle CML with consistent units
(f)	Arc of a circle inside the hexagon, radius 6 cm. Correct labelling	1 1ft	Must be bounded by their LM, MD, part of DE and attempt at an arc

8 (a)	y values –1, –2, –3, 3, 2, 1	3	W2 4 or 5 correct W1 2 or 3 correct
(b)	12 points plotted Two smooth correct curves No part across y axis	P2ft C1 B1	P1ft for 10 or 11 'correct'. Independent
(c)	2	1	
(d) (i)	$y = x$ ruled	1	At least 2 diagonal large (4×4) squares.
(ii)	(4 to 4.5, 4 to 4.5) (–4 to –4.5, –4 to –4.5)	2ft	1 mark for each point Ft from their intersections
(e)	$y = -x$ ruled	1ft	Follow through reflection of their **(d)(i)** in the y axis.
9 (a) (i)	$3k + 4p - 7$ final answer	2	W1 for any 2 correct terms seen or correct answer seen but spoiled by subsequent working.
(ii)	$x - 2y^2$ final answer	2	W1 for a correct term seen or correct answer seen but spoiled by subsequent working.
(b) (i)	$12 + 21g$ final answer	1	
(ii)	$25m^3 - 5mt^2$ final answer	2	W1 for one correct term
10(a) (i)	9.43 art	2	M1 for $\sqrt{8^2 + 5^2}$ oe or $\sqrt{89}$
(ii)	32 or 32.0 art	2	M1 for tan (A =) 5 ÷ 8 or better
(b) (i)	Similar	1	
(ii)	Enlargement (SF) 2 (Centre) A	1 1 1	W1 for each Independent Independent
(c)	9 and 11	2	W1 for 1 correct or diagram 5 two more than diagram 4.
(d) (i)	21	1	
(ii)	$2n + 1$ oe	2	W1 for $2n + j$ seen or $kn + 1$ seen where $k \neq 0$
(e)	23	2	M1 for $2n + 1 = 47$ seen or their **(d)(ii)** = 47 seen SC1 for embedded answer