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

0580/23 Paper 23 (Extended), maximum raw mark 70

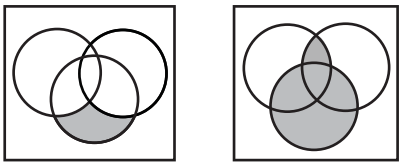
This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the May/June 2010 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

UNIVERSITY of CAMBRIDGE
International Examinations

Qu.	Answers	Mark	Part Marks
1	**(a)** –5	1	
	(b) 11	1	
2	$\frac{53}{11} > 4.80 > \sqrt{23} > 48\%$	2	**M1** for decimals seen 4.7958… 0.48 (4.80) 4.81(…)
3	500	2	**M1** for $600 \times 0.6 \div 0.72$ seen
4	70	2	**M1** for $252 \times 1000 \div 60 \div 60$ oe
5	18	2	**M1** for $21.6 \div 1.2$ oe
6	$x + 8$	2	**M1** 3^8 seen
7		2	**B1** for one correct Venn diagram
8	$\frac{5x-3}{6}$	2	**B1** for $5x - 3$ seen **SC1** $\frac{5}{6}x - \frac{3}{6}$ on answer line
9	$5(.00) \times 10^5$	2	**SC1** for 5×10^k or 500 000 on answer line
10	220.5 **cao**	2	**M1** for 73.5 seen
11	16.8	3	**M2** $\tan 17 = \frac{h}{55}$ or $\tan 73 = \frac{55}{h}$ **or M1** $\tan 17 = \frac{55}{h}$ or $\tan 73 = \frac{h}{55}$ if angle seen in wrong place at P
12	$9 - 2x^2$	3	**B1** for $x^2 - 3x - 3x + 9$ or $2x^2 - 6x - 6x + 18$ **B1** for $4x^2 - 6x - 6x + 9$ or $-4x^2 + 6x + 6x - 9$
13	**(a)** 0	1	
	(b) 2	1	
	(c) plane across centre of shape	1	Three possibilities
14	6	3	**M1** for one correct first step which leads towards simplifying $3y - 12 + \frac{y}{2} = 9$ or $6(y - 4) + y = 18$ or $y - 4 + \frac{y}{6} = 3$ **M1** correctly collecting their terms to $py = q$

© UCLES 2010

15	**(a)** $\mathbf{g} - \mathbf{h}$	1	
	(b) $\frac{1}{4}\mathbf{g} + \frac{3}{4}\mathbf{h}$	2	**M1** for $\overrightarrow{OH} + \overrightarrow{HN}$ or $\mathbf{h} + \frac{1}{4}$ **(a)** $\overrightarrow{OG} + \overrightarrow{GN}$ or $\mathbf{g} - \frac{3}{4}$ **(a)**
16	$\frac{5A}{r} - 2$ or $\frac{5A - 2r}{r}$	3	**M1** for correctly multiplying by 5 **M1** for correctly dividing by r **M1** for correct subtraction in any order
17	**(a)** 10.9	2	**M1** for $\frac{40}{360} \times \pi \times 5.6^2$
	(b) 15.1	2	**M1** for $\frac{40}{360} \times \pi \times 2 \times 5.6$ (= 3.91..)
18	**(a)** 64	2	**B1** for evidence of f(–2) = 6
	(b) 9	2	**M1** for $3x - 5 = 22$ or $\frac{x+5}{3}$ seen
19	**(a)** $\frac{3}{4}$ or 0.75	1	
	(b) 2.6	3	**M1** for finding the area under the graph or **M1** for their 39 ÷ 15
20	$x \geqslant 0$	1	**L1** x R 0
	$y \geqslant \frac{1}{2}x$ oe	2	**L1** y R $\frac{1}{2}x$
	$x + y \leqslant 4$ oe	2	**L1** $x + y$ R 4 where R is any one of $= < > \leqslant \geqslant$ **B2** all inequalities correct or **B1** 2 correct
21	**(a)** 18.7	3	**M2** for $\sin R = 50 \times \frac{\sin 140}{100}$ (= 0.3219…) or **M1** for $\frac{\sin R}{50} = \frac{\sin 140}{100}$ oe
	(b) 261(.3)	2**ft**	**M1** 360 – 80 – their **(a)**
22	Perpendicular bisector of AC	2	**B1** accurate line **B1** two pairs of correct construction arcs
	Bisector of angle A	2	**B1** accurate line **B1** two pairs of correct construction arcs
	Shaded region inside triangle **and** to left of perp bisector of AC **and** above bisector of angle A	1	**B1 dep** on first **B1** being scored for **both** lines
23	**(a)** $\begin{pmatrix} -5 & 7 \end{pmatrix}$	2	**B1** either correct in a (1 × 2) matrix
	(b) $\frac{1}{4}\begin{pmatrix} 2 & 1 \\ 2 & 3 \end{pmatrix}$ oe	2	**M1** for $\begin{pmatrix} 2 & 1 \\ 2 & 3 \end{pmatrix}$ seen or 2 × 3 – –1 × –2 (= 4)
	(c) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ or I cao	1	

© UCLES 2010