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

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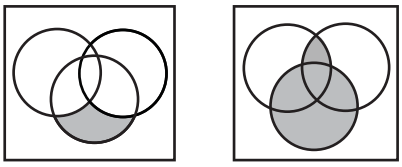
Qu.	Answers	Mark	Part Marks
1	**(a)** –5 **(b)** 11	1 1	
2	$\frac{53}{11} > 4.80 > \sqrt{23} > 48\%$	2	**M1** for decimals seen 4.7958… 0.48 (4.80) 4.81(…)
3	500	2	**M1** for $600 \times 0.6 \div 0.72$ seen
4	70	2	**M1** for $252 \times 1000 \div 60 \div 60$ oe
5	18	2	**M1** for $21.6 \div 1.2$ oe
6	$x + 8$	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 **(b)** 2 **(c)** plane across centre of shape	1 1 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 $py = q$

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	