

**MARK SCHEME for the May/June 2010 question paper**  
**for the guidance of teachers**

**0581 MATHEMATICS**

**0581/23**

Paper 23 (Extended), maximum raw mark 70

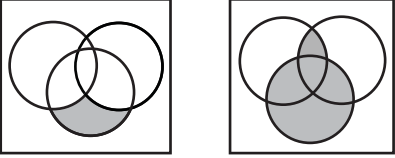
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Qu.	Answers	Mark	Part Marks
1	(a) -5 (b) 11	1 1	
2	$\frac{53}{11} > 4.80 > \sqrt{23} > 48\%$	2	M1 for decimals seen 4.7958... 0.48 (4.80) 4.81(...)
3	500	2	M1 for $600 \times 0.6 \div 0.72$ seen
4	70	2	M1 for $252 \times 1000 \div 60 \div 60$ oe
5	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 $5 \times 10^k$ 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 $py = q$

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