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## 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	1	
	<b>(b)</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	<b>M1</b> for $600 \times 0.6 \div 0.72$ seen
4	70	2	<b>M1</b> for $252 \times 1000 \div 60 \div 60$ oe
5	18	2	<b>M1</b> for 21.6 ÷ 1.2 oe
6	x + 8	2	M1 3 <sup>8</sup> seen
7		2	B1 for one correct Venn diagram
8	$\frac{5x-3}{6}$	2	<b>B1</b> for $5x - 3$ seen SC1 $\frac{5}{6}x - \frac{3}{6}$ on answer line
9	$5(.00) \times 10^5$	2	<b>SC1</b> for $5 \times 10^k$ or 500 000 on answer line
10	220.5 <b>cao</b>	2	<b>M1</b> for 73.5 seen
11	16.8	3	M2 tan 17 = $\frac{h}{55}$ or tan 73 = $\frac{55}{h}$
			of Wi tan? $-\frac{h}{h}$ of tan? $-\frac{h}{55}$ if angle seen in
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>(b)</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 $pv = a$

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15	(a) g h		1			ary is
15	(a) g = n	2	1		→ 1	°C/O,
	<b>(b)</b> $\frac{1}{4}$ <b>g</b> + $\frac{3}{4}$ <b>h</b>		2	<b>M1</b> for $\overrightarrow{OH}$ + $\overrightarrow{H}$	$\overline{N}$ or $\mathbf{h} + \frac{1}{4}$ (a)	U.C.
				$\overrightarrow{OG}$ + $\overrightarrow{GR}$	$\vec{N}$ or $g - \frac{3}{4}$ (a)	-OM
16	$\frac{5A}{r} - 2$ or $\frac{5A - 2r}{r}$		3	M1 for correctly multiplying by 5 M1 for correctly dividing by <i>r</i> M1 for correct subtraction in any order		
17	<b>(a)</b> 10.9		2	<b>M1</b> for $\frac{40}{360} \times \pi \times \pi$	5.6 <sup>2</sup>	
	<b>(b)</b> 15.1		2	<b>M1</b> for $\frac{40}{360} \times \pi \times 2 \times 5.6$ (= 3.91)		
18	<b>(a)</b> 64		2	<b>B1</b> for evidence of	f(-2) = 6	
	<b>(b)</b> 9		2	<b>M1</b> for $3x - 5 = 22$	2 or $\frac{x+5}{3}$ seen	
19	(a) $\frac{3}{4}$ or (	).75	1			
	<b>(b)</b> 2.6		3	M1 for finding the M1 for their 39 ÷	e area under the graph or 15	
20	$x \ge 0$		1	<b>L1</b> <i>x</i> <b>R</b> 0		
	$y \ge \frac{1}{2}x$	oe	2	L1 y R $\frac{1}{2}x$		
	$x + y \le 4$	oe	2	<b>L1</b> $x + y$ R 4 when <b>B2</b> all inequalities	re R is any one of = <> correct or <b>B1</b> 2 correct	$\leq \geq$
21	<b>(a)</b> 18.7		3	<b>M2</b> for $\sin R = 50$ or <b>M1</b> for $\frac{\sin R}{50} =$	$\times \frac{\sin 140}{100} \ (= 0.3219)$ $\frac{\sin 140}{100} \ \text{oe}$	
	<b>(b)</b> 261(.3	3)	2 <b>ft</b>	<b>M1</b> 360 – 80 – the	eir (a)	
22	Perpendic	ular bisector of $AC$	2	B1 accurate line B1 two pairs of co	rrect construction arcs	
	Bisector o	f angle A	2	<b>B1</b> accurate line <b>B1</b> two pairs of co	rrect construction arcs	
	Shaded reated to left of p above bise	gion inside triangle <b>and</b> erp bisector of <i>AC</i> <b>and</b> ector of angle <i>A</i>	1	B1 dep on first B1	being scored for <b>both</b> 1	ines
23	(a) (-5	7)	2	B1 either correct in	n a $(1 \times 2)$ matrix	
	<b>(b)</b> $\frac{1}{4} \begin{pmatrix} 2 \\ 2 \end{pmatrix}$	$\begin{pmatrix} 1\\3 \end{pmatrix}$ oe	2	<b>M1</b> for $\begin{pmatrix} 2 & 1 \\ 2 & 3 \end{pmatrix}$	seen or $2 \times 31 \times -$	2 (=4)
	(c) $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$	$\begin{pmatrix} 0\\1 \end{pmatrix}$ or I cao	1			