

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

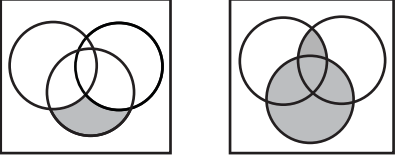
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| Qu. | Answers | Mark | Part Marks |
|-----|---|-------------|---|
| 1 | (a) -5 (b) 11 | 1 1 | |
| 2 | $\frac{53}{11} > 4.80 > \sqrt{23} > 48\%$ | 2 | M1 for decimals seen 4.7958... 0.48 (4.80) 4.81(...) |
| 3 | 500 | 2 | M1 for $600 \times 0.6 \div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

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| | | | |
|----|--|-----|--|
| 15 | (a) $\mathbf{g - h}$ | 1 | M1 for $\overrightarrow{OH} + \overrightarrow{HN}$ or $\mathbf{h} + \frac{1}{4}$ (a) $\overrightarrow{OG} + \overrightarrow{GN}$ or $\mathbf{g} - \frac{3}{4}$ (a) |
| | (b) $\frac{1}{4}\mathbf{g} + \frac{3}{4}\mathbf{h}$ | 2 | |
| 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 | M1 for finding the area under the graph or M1 for their $39 \div 15$ |
| | (b) 2.6 | 3 | |
| 20 | $x \geq 0$ | 1 | L1 x R 0 |
| | $y \geq \frac{1}{2}x$ oe | 2 | L1 y R $\frac{1}{2}x$ |
| | $x + y \leq 4$ oe | 2 | L1 $x + y$ R 4 where R is any one of $= < > \leq \geq$ 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) | 2ft | M1 $360 - 80 - \text{their (a)}$ |
| 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) $(-5 \quad 7)$ | 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 $2 \times 3 - -1 \times -2 (= 4)$ |
| | (c) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ or I cao | 1 | |