

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

**MARK SCHEME for the May/June 2011 question paper
for the guidance of teachers**

0580 MATHEMATICS

0580/22

Paper 2 (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.

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

Cambridge is publishing the mark schemes for the May/June 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

| | | | |
|---------------|---------------------------------------|-----------------|--------------|
| Page 2 | Mark Scheme: Teachers' version | Syllabus | Paper |
| | IGCSE – May/June 2011 | 0580 | 22 |

Abbreviations

| | |
|-----|----------------------------|
| cao | correct answer only |
| cso | correct solution only |
| dep | dependent |
| ft | follow through after error |
| isw | ignore subsequent working |
| oe | or equivalent |
| SC | Special Case |
| www | without wrong working |

| Qu. | Answers | Mark | Part Mark |
|-----|--|---------------|--|
| 1 | 53.1 | 2 | B1 $C = 36.9$ seen, must have C stated or marked on the diagram or M1 $\sin A = \frac{4}{5}$ or $\tan A = \frac{4}{3}$ but must have A stated |
| 2 | $\sqrt{3} + \sqrt{6}, \pi$ | 2 | –1 for each error or omission |
| 3 | Working must be shown | 2 | M1 $\frac{14}{9}$ and $\frac{16}{9}$ M1 $\frac{14}{16} = \frac{7}{8}$ oe or visible cancelling |
| 4 | 0.8^2 | 2 | M1 conversion of $\frac{16}{27}$ ($= 0.5(9\dots)$) and 0.8^2 ($= 0.64$) to decimals seen |
| 5 | (6)€ or euros (with correct working) | 2 | M1 one of 6×1.9037 or $11.5 \div 1.9037$ or $11.5 \div 6$ seen |
| 6 | 3.322 cao | 2 | B1 3.3219(...) or 3.32(20) seen |
| 7 | 1.85×10^4 | 3 | B2 18500 oe seen or M1 $4x = 74000$ or $x = 2 \times 10^4 - 1.5 \times 10^3$ |
| 8 | 16 | 3 | M1 $p = k\sqrt{q}$ A1 $k = 1.6$ or $8/5$ |
| 9 | 1275, 1425 | 3 | B1 85 or 95 or 0.85 or 0.95 M1 their LB or UB $\times 1500$ where $85 \leq \text{LB} < 90$ $90 < \text{UB} \leq 95$ |
| 10 | (a) (0)700 or 7 am (b) 1700 or 5 pm | 2 1 | M1 $100 - (5 \times \text{their}(22 - 6) + \text{their}(13 - 8))$ or better soi |
| 11 | $\frac{4+bc}{c}$ or $\frac{4}{c} + b$ cao | 3 | M1 correct move completed M1 second correct move completed M1 third correct move completed |
| 12 | $x = 1$ $y = 0.2$ or $\frac{1}{5}$ only | 3 | M1 consistent mult and add/subtraction A1 one value correct after M awarded |
| 13 | (a) 72 (b) 36 (c) 54 | 1 1 2ft | ft 90 – (b) M1 $POQ = 108$ |

| Page 3 | Mark Scheme: Teachers' version | Syllabus | Paper |
|--------|--------------------------------|----------|-------|
| | IGCSE – May/June 2011 | 0580 | 22 |

| | | | |
|----|--|---|--|
| 14 | (a) 84 | 1 | |
| | (b) 15 | 1 | |
| | (c) 6.28 | 2 | M1 $\frac{120}{360} \times 2 \times \pi \times 3$ oe |
| 15 | $\frac{1-3x}{(x+1)(x+5)}$ www | 4 | M1 $(x+1)^2 - x(x+5)$ oe B1 $x^2 + x + x + 1$ B1 denominator(s) $(x+1)(x+5)$ or $x^2 + 6x + 5$ |
| 16 | (a) $\frac{1}{2}a - \frac{1}{2}c$ oe | 2 | M1 correct but unsimplified e.g. $\frac{1}{2}a + -\frac{1}{2}c$ |
| | (b) $\frac{3}{4}a + \frac{3}{4}c$ oe | 2 | M1 correct but unsimplified |
| 17 | (a) $4x^{-24}$ or $\frac{4}{x^{24}}$ | 2 | B1 $4x^n$ B1 $\frac{k}{x^{24}}$ or kx^{-24} for any numerical k, n |
| | (b) $\frac{x^2}{16}$ | 2 | B1 $\frac{x^2}{k}$ or B1 $\frac{x^n}{16}$ SC1 $(\frac{x}{4})^2$ |
| 18 | (a) (6, 1½) | 1 | |
| | (b) $y = -\frac{1}{5}x + 4$ oe | 3 | B1 correct numerical format B1 correct m B1 correct c |
| 19 | (a) 8 | 1 | |
| | (b) $4x - 9$ | 2 | M1 $2(2x - 3) - 3$ seen |
| | (c) $2^{2(x+1)}$ or 2^{2x+2} or 4^{x+1} | 2 | M1 $(2^{x+1})^2$ seen |
| 20 | (a) (i) | 2 | B1 correct line B1 2 sets of correct arcs |
| | (ii) | 2 | B1 correct line B1 two sets of correct arcs |
| | (b) | 1 | correct region, shaded or shown by the letter R |
| 21 | (a) (i) (0) brackets essential | 2 | M1 $6 \times 2 + 3 \times -4$ or $12 + -12$ |
| | (ii) $\begin{pmatrix} 12 & 18 \\ -8 & -12 \end{pmatrix}$ | 2 | M1 any 2×2 matrix with 2 elements correct |
| | (b) $\frac{1}{2} \begin{pmatrix} 1 & -1 \\ -1 & 3 \end{pmatrix}$ | 2 | B1 $\frac{1}{2} \begin{pmatrix} a & c \\ b & d \end{pmatrix}$ seen or B1 $k \begin{pmatrix} 1 & -1 \\ -1 & 3 \end{pmatrix}$ seen |