

CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

MARK SCHEME for the May/June 2013 series

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| 0581 MATHEMATICS | |
| 0581/21 | 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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

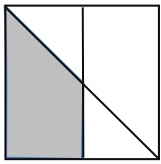
Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

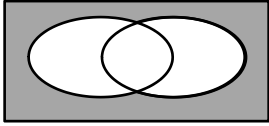
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Abbreviations

| | |
|-----|----------------------------|
| 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 |
| soi | seen or implied |

| Qu. | Answers | Mark | Part Marks |
|-------|---|------|--|
| 1 | 11 or -11 | 1 | |
| 2 (a) | 1.32656... | 1 | |
| (b) | 1.327 | 1ft | |
| 3 | 72 | 2 | M1 for $84 \div 7$ |
| 4 | 105 | 2 | M1 for $180 - 55 - 50$ or B1 for 55 or 75 seen in the correct angle inside the triangle |
| 5 | correct working; e.g. $\frac{3k}{2k} \times \frac{16n}{3n} = 8$ | 2 | M1 for $\frac{3k}{2k}$ and A1 for $\frac{3k}{2k} \times \frac{16n}{3n} = 8$ |
| 6 | $3x(4y - x)$ final answer | 2 | B1 for $3(4xy - x^2)$ or $x(12y - 3x)$ |
| 7 (a) | Equidistant from A and B (or C and D or AD and BC) | 1 | |
| (b) |  | 1 | |
| 8 | $x \geq -\frac{3}{8}$ oe | 2 | M1 for $-3 \leq 8x$ oe If 0 then SC1 for $-\frac{3}{8}$ with incorrect inequality. |
| 9 | 48.15, 48.45 cao | 2 | B1 B1 If 0 then M1 for 16.0 and 16.15 soi |
| 10 | $(a + b)(p - 2)$ | 2 | B1 $p(a + b) - 2(a + b)$ or $a(p - 2) + b(p - 2)$ |
| 11 | $3x^4$ | 2 | B1 for kx^4 or $3x^k$ |

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| | | | |
|------------|---|-----|--|
| 12 (a) | $\frac{3}{11}$ | 1 | |
| (b) |  | 1 | |
| 13 | 175 cao final answer | 3 | B2 for 175.4 ... or M1 for $200 \div 1.14$ |
| 14 | 454.27 cao final answer | 3 | M1 for $420 \times (1 + \frac{4}{100})^2$ oe and A1 for 454 or 454.2 to 454.3 or SC2 for answer 34.27 or SC1 for answer 34.2 to 34.3 |
| 15 | 2.67 or 2.672 to 2.67301 | 3 | M2 for $\sqrt[3]{(80 \div \frac{4}{3}\pi)}$ oe or M1 for $80 \div (\frac{4}{3}\pi)$ oe |
| 16 | 35.4 or 35.36 to 35.37 | 3 | M2 for $1000 \div (\pi \times 0.75^2 \times 16)$ oe or M1 for $\pi \times 0.75^2 \times 16$ oe or $1000 \div (\pi \times 0.75^2)$ |
| 17 | $y = 2x - 1$ | 3 | B2 for $y = mx - 1$ or $y = 2x + c$ or $2x - 1$ or B1 for gradient = 2, B1 for $c = -1$ or SC1 for $\frac{6}{3}$ or $\frac{5 - -1}{3[-0]}$ |
| 18 (a) | $(x + 6)(x - 5)$ | 2 | SC1 for $(x + a)(x + b)$ where $ab = -30$ or $a + b$ |
| (b) | $\frac{x + 4}{x + 6}$ final answer | 1 | |
| 19 | $\frac{6}{7}$ or 0.857[1...] | 3 | M1 for $t = \frac{k}{\sqrt{u}}$ oe A1 for $k = 6$ |
| 20 (a) (i) | $p + \frac{1}{2}r$ | 1 | |
| (ii) | $2p + r$ | 1ft | $2 \times \text{their (i)}$ |
| (b) | Midpoint of RQ | 1 | |

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|--------|--|---|---|
| 21 | 52.3 or 52.27 to 52.28 | 3 | <p>SC2 for 28.3 or 28.7 to 28.8</p> <p>If 0, M2 for $\frac{135}{360} \times \pi \times 24 + 2 \times 12$</p> <p>or M1 for $\frac{135}{360} \times \pi \times 24$</p> |
| 22 | $\frac{5x+13}{(x+3)(x+2)}$ oe final answer | 3 | <p>B1 for common denominator $(x+3)(x+2)$ seen</p> <p>M1 for $2(x+2) + 3(x+3)$ soi</p> |
| 23 | 24.8 or 24.77 to 24.78 | 4 | <p>M1 for recognition of angle CEA</p> <p>M1 for $\sqrt{12^2 + 5^2}$</p> <p>M1 for $\tan = \frac{6}{\text{their } AE}$ oe</p> |
| 24 (a) | $\begin{pmatrix} 6 & 7 \\ 16 & 17 \end{pmatrix}$ | 2 | B1 for 1 correct row or 1 correct column |
| (b) | $\frac{1}{5} \begin{pmatrix} 2 & -3 \\ -1 & 4 \end{pmatrix}$ | 2 | B1 for $k \begin{pmatrix} 2 & -3 \\ -1 & 4 \end{pmatrix}$ or $\frac{1}{5} \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ |
| 25 (a) | 2.8 oe | 1 | |
| (b) | 700 | 3 | <p>M2 for $\frac{1}{2}(20+30) \times 28$ oe</p> <p>or M1 for a correct area statement</p> |
| 26 | 420 | 5 | <p>M1 for $[CB =] \sqrt{4^2 + (9-6)^2}$</p> <p>M1 for <i>their</i> CB from Pythagoras $\times 15$</p> <p>M1 for $[2 \times] \frac{1}{2}(6+9) \times 4$</p> <p>M1 for $4 \times 15, 9 \times 15, 6 \times 15$ with intention to add</p> |