

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

MARK SCHEME for the May/June 2009 question paper
for the guidance of teachers

0607 CAMBRIDGE INTERNATIONAL MATHEMATICS

0607/02

Paper 2 (Extended), maximum raw mark 40

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.

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|--------|--------------------------------|----------|
| Page 2 | Mark Scheme: Teachers' version | Syllabus |
| | IGCSE – May/June 2009 | 0607 |

M marks are given for a correct method.

A marks are given for an accurate answer following a correct method.

B marks are given for a correct statement or step.

D marks are given for a clear and appropriately accurate drawing.

P marks are given for accurate plotting of points.

E marks are given for correctly explaining or establishing a given result.

Abbreviations

cao correct answer only

cso correct solution only

ft follow through

oe or equivalent

soi seen or implied

ww without working

www without wrong working

| | | | |
|--------------|--|-------------------------------------|---|
| 1 (a) | $4 \times 3.8 \times 10^5$ $1.52(0\dots) \times 10^6$ | M1 A1 | If zero scored SC1 for 1.5×10^6 ww. www 2 [2] |
| 2 (a) | 2 | B1 | Accept $\frac{2\pi}{3}$ [2] |
| (b) | 120 | B1 | |
| 3 | $x = 45$ $y = 40$ $z = 70$ | B1 B1 B1 | Answers on the diagram can be accepted on the diagram unless contradicted in the answer spaces. [3] |
| 4 (a) | $\frac{1}{3}(p+q)$ oe | B1 | Accept \pm , $-$, $+$ Not \sqrt{xy} [2] |
| (b) | \sqrt{xy} or any unambiguous equivalent | B1 | |
| 5 (a) | $-3, -2, -1, 0, 1$ | B1 | [3] |
| (b) | 29, 31 | B1 | |
| (c) | $-4, 4$ | B1 | |
| 6 (a) | $\log 9$ | B1 | Accept $2 \log 3$ |
| (b) | $4\sqrt{2}$ or $2\sqrt{8}$ or $\sqrt{32}$ | B2 | B1 for two of $7\sqrt{2}$ or $5\sqrt{2}$ or $2\sqrt{2}$ seen [3] |
| 7 (a) | 35, 48 | B1 | [3] |
| (b) | $n^2 - 1$ oe | B2 | |

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| Page 3 | Mark Scheme: Teachers' version | Syllabus |
| | IGCSE – May/June 2009 | 0607 |

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|------------|--|--|---|
| 8 (a) | Correct translation. Top of flag at (2,1) | D2 | D1 any other translation. Ignored |
| (b) | Correct reflection. Top of flag at (3,3) | D2 | D1 Reflection $y = 1$, or reflecting the P in $x = 1$ |
| | | | [4] |
| 9 | Attempt to get 2 equations for elimination Correct addition/subtractions of their equations $x = -1$ $y = 3$ OR Equation $x =$ or $y =$ from one equation Substitute their expression into other equation correctly $x = -1$ $y = 3$ www 4 | M1 M1 A1 A1 OR M1 M1 A1 A1 | Condone 1 slip Condone 1 further slip (dep on first M1) Condone 1 slip No further slips (dep on first M1) |
| | | | [4] |
| 10 | For correct multiplication by $t - 2$ For a correct division by y For adding 2 or $2y$ correctly as appropriate Leading to $t = \frac{a + 2y}{y}$ or $t = \frac{a}{y} + 2$ www 3 | M1 M1 M1 | Can be in any order Final answer must be correct to score M3 |
| | | | [3] |
| 11 (a) (i) | $\begin{pmatrix} 6 \\ -3 \end{pmatrix}$ cao | B1 | |
| (ii) | $6^2 + 3^2$ $= \sqrt{45}$ or $3\sqrt{5}$ | M1 A1ft | Only if (a)(i) is in non zero integer form |
| (b) | Gradient = $\frac{-3}{6}$ oe | B2 | If B0 then B1ft for Gradient = $\frac{\text{change in their } y}{\text{change in their } x}$ B1 for negative gradient (indep) If still B0 SC1 for $\frac{-3}{6}x$ oe |
| (c) | Midpoint = $(0, \frac{7}{2})$ oe cao | B1 | |
| (d) | Gradient of perpendicular = 2 or $\frac{-1}{\text{their}(b)}$ $y = mx + \frac{7}{2}$ oe (indep) | B1ft B1 | Implied by $(y =) 2x \pm c$ |
| | | | [8] |
| 12 (a) | 64 | B1 | |
| (b) | $\frac{3}{4}$ or 0.75 | B2 | If B0, then B1 for $(\frac{\sqrt{3}}{2})^2$ seen |
| | | | [3] |