

MARK SCHEME for the May/June 2014 series

4024 MATHEMATICS

4024/12

Paper 1, maximum raw mark 80

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 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

| Question | Answers | Mark | Part Marks |
|----------|---|------|--|
| 1 | (a) 14 | 1 | |
| | (b) 0.3oe | 1 | |
| 2 | (a) 9 | 1 | |
| | (b) -2.5 | 1 | |
| 3 | (a) Decimal between 0.75 and 0.875 | 1 | |
| | (b) Fraction between $\frac{3}{4}$ and $\frac{7}{8}$ | 1 | E.g. $\frac{13}{16}$ or $\frac{4}{5}$ |
| 4 | (a) 47 | 1 | |
| | (b) 11 03 | 1 | |
| 5 | (a) 8.52×10^{-5} final answer | 1 | |
| | (b) 5×10^6 | 1 | |
| 6 | (a) Rotational symmetry of order 3 0 lines of symmetry | 1 | Both correct |
| | (b) Pattern completed correctly | 1 | |
| 7 | 54 | 2 | C1 for answer 36 Or B1 for $k = \frac{3}{200}$ oe or for $\frac{C}{24} = \frac{60^2}{40^2}$ |
| 8 | (a) Isosceles | 1 | |
| | (b) 128° | 1 | |
| 9 | (a) $\frac{25}{28}$ oe final answer | 1 | |
| | (b) $3\frac{1}{3}$ final answer | 2 | B1 for $\frac{10}{3}$ oe or for $\frac{16}{3} \times \frac{5}{8}$ |
| 10 | (a) 406 000 000 oe | 1 | |
| | (b) 5 | 2 | B1 for two of 40, 10 and 0.8 seen |

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| 11 (a) | | 1 | |
| (b) | 12 | 2 | B1 for 8 seen |
| 12 (a) | $\begin{pmatrix} 172 \\ 206 \end{pmatrix}$ oe | 2 | B1 for one value correct |
| (b) | Amount taken on Monday and Tuesday | 1 | |
| 13 (a) | 17 | 1 | |
| (b) | $\frac{2-x}{3}$ oe | 2 | C1 for $\frac{x-2}{3}$ oe B1 for $\frac{2-y}{3}$ Or M1 for $x = 2 - 3y$ soi |
| 14 (a) | 35.5 | 1 | |
| (b) | 118 | 2 | B1 for use of 34.5 and 24.5 |
| 15 (a) | 0.5 | 1 | |
| (b) | $x \geq 1$ $y \geq 0.5x + 1$ oe | 2 | FT <i>their</i> gradient in $y \geq mx + 1$ B1 for one correct Or B1 for both $x = 1$ and $y = 0.5x + 1$ soi |
| 16 (a) | 40 | 1 | |
| (b) | 56.25 | 1 | |
| (c) (i) | 225 | 1 | |
| (ii) | 400 | 1 | |
| 17 (a) | $\begin{pmatrix} 3 \\ 1 \end{pmatrix}$ | 1 | |
| (b) | $\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$ | 1 | |
| (c) | Correct enlargement, vertices $(-1, 2), (1, 2), (1, 6)$ | 2 | B1 for two vertices correct for correct size and correct orientation |

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| Page 4 | Mark Scheme | Syllabus |
| | GCE O LEVEL – May/June 2014 | 4024 |

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| 18 (a) | 135 | 1 | |
| (b) (i) | 165 | 1FT | FT 300 – <i>their</i> (a) |
| (ii) | 24 cao | 2 | M1 for $360 \div (180 - \textit{their} 165)$ |
| 19 (a) (i) | 6 | 1 | |
| (ii) | 3 | 1 | |
| (b) | $\frac{16b^6}{a^2}$ or $16b^6a^{-2}$ | 2 | B1 for answer with 16 in numerator or for two out of three terms algebraically correct Or B1 for $\frac{(1)a}{4b^3}$ or better seen |
| 20 (a) | $\frac{v}{25}$ | 1 | |
| (b) | 10 | 2 | B1 for any correct expression for one area |
| (c) | 108 | 1 FT | |
| 21 (a) | $\frac{7}{10}, \frac{7}{9}, \frac{3}{9}, \frac{6}{9}$ correctly completed | 1 | |
| (b) (i) | $\frac{1}{15}$ | 1 | |
| (ii) | $\frac{7}{15}$ FT | 2 | B1 for $\frac{21}{90}$ oe FT Or M1 for $\frac{3}{10} \times \frac{7}{9} + \frac{7}{10} \times \frac{3}{9}$ |
| 22 (a) | 9 | 2 | B1 for $\sqrt{15^2 - 12^2}$ |
| (b) | 279 | 2FT | B1 for $0.5 \times \textit{their} 9 \times 12$ B1 for $(\textit{their} 9)^2 + 12^2$ |
| 23 (a) | $2x^2 + 9x + 4$ | 1 | |
| (b) | $\frac{7x+6}{x(x+2)}$ final answer | 1 | |
| (c) | 2 or -5 | 3 | B2 for $(x-2)(x+5)(=0)$ Or $\frac{-3 \pm \sqrt{49}}{2}$ B1 for $x^2 + 3x - 10 = 0$ oe 3 term equation or $x^2 + 3x - 10$ |

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| Page 5 | Mark Scheme | Syllabus |
| | GCE O LEVEL – May/June 2014 | 4024 |

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|----|-----|---|---|--|
| 24 | (a) | Correct frequency polygons drawn | 3 | Consisting of these marks which are awarded singly: B1 for linear scale up to 8 on frequency axis B1 for plots at correct heights B1 for plotting their points at centre of interval and joined with ruled lines |
| | (b) | $1 < t \leq 1.5$ | 1 | |
| | (c) | Correct comment(s) making a comparison of times between girls and boys. | 1 | E.g. The mode for the boys is higher than the mode for the girls The range of times was longer for boys than for girls. Most girls spent between 1 and 2 hours, but boys times more evenly spread between 0 and 3 hours |
| 25 | (a) | $(2y + x) + (3y + x) + (2y + 10) + (3x + 5) = 360$ | 1 | |
| | (b) | $x = 20, y = 35$ | 3 | B2 for one correct with supporting working Or M1 for correct method to eliminate one variable, condoning one arithmetic slip , Or correct substitution to obtain an equation in one variable and A1ft for correct evaluation to find the other variable Or SC1 After 0 scored, for correct substitution and evaluation to find the other variable |
| | (c) | 65 cao | 1 | |