**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**GCE Ordinary Level**

# MARK SCHEME for the May/June 2010 question paper

# for the guidance of teachers

## 4024 MATHEMATICS (SYLLABUS D)

**4024/11** Paper 11, maximum raw mark 75

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UNIVERSITY of CAMBRIDGE
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| Qu | Answers | Mark | Part Marks |
|---|---|---|---|
| 1 | **(a)** $\frac{13}{18}$ oe | 1 | |
| | **(b)** $\frac{22}{27}$ oe | 1 | |
| 2 | **(a)** 9 | 1 | |
| | **(b)** 12 | 1 | |
| 3 | **(a)** 63 | 1 | |
| | **(b)** $\frac{28}{\pi}$ | 1 | |
| 4 | 64 | 2 | M1 for (60 + 20) ÷ ( total time) |
| 5 | **(a)** C | 1 | |
| | **(b)** (0)40$^{(°)}$ | 1 | |
| 6 | **(a)** $x < 3.5$ | 1 | |
| | **(b)** 3 | 1ft | ft from their **(a)** |
| 7 | TRUE<br>TRUE<br>FALSE Valid Example | 2 | B1 for TRUE TRUE<br>or FALSE with valid example evaluated |
| 8 | **(a)** 49 | 1 | |
| | **(b)** 18 | 1 | |
| 9 | **(a)** 6.5 | 1 | |
| | **(b)** 6 | 2 | B1 for 7.5 seen |
| 10 | **(a)** (0).012 | 1 | |
| | **(b)** 300 | 1 | |
| | **(c)** 3 cao | 1 | |
| 11 | Congruent triangles established and conclusion | 3 | M1 for CO = OD or AO = OB<br>M1 for $A\hat{O}C = B\hat{O}D$<br>A1 for both pairs of equal sides, equal angles, a valid reason and conclusion |
| 12 | **(a)** 1.5 , 6.5 | 1 | |
| | **(b)** $x \geqslant 0, y \geqslant 4, x \leqslant 3$ | 2 | C1 for two correct or all 3 inequalities consistently wrong, or = |

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| | | | |
|---|---|---|---|
| **13** | **(a)** (400 350) | 2 | C1 for 750<br>B1 for 400 or 350 seen |
| | **(b)** Total cost (of each family's order). | 1 | |
| **14** | Correct histogram | 3 | B2 for three correct columns<br>B1 for one correct column<br>SC1 for correct frequency densities |
| **15** | **(a)** 40.81 | 1 | |
| | **(b)** **(i)** 6.9(0) | 1 | |
| | **(ii)** 2.76 | 2 | M1 for their **(b)(i)** ÷ 2.50 |
| **16** | **(a)** 6 8 13 | 3 | C2 for total 27 with their median 8 or<br>C1 8 or total 27 or<br>B1 for 27 seen or<br>M1 for a relevant equation containing such as $x$ and $x+7$ or $y-7$ and $y$ |
| | **(b)** 17 cao | 1 | |
| **17** | **(a)** $y = \frac{36}{x^2}$ | 2 | C1 for $y = \frac{k}{x^2}$<br>B1 for $k = 36$ seen<br>M1 for $y = \frac{k}{x^2}$ seen with any $k$ |
| | **(b)** 9 cao | 1 | |
| | **(c)** ±6 cao | 1 | |
| **18** | **(a)** 50 | 1 | |
| | **(b)** 65 | 1 | |
| | **(c)** 45 | 1 | |
| | **(d)** 225 | 1 | |
| **19** | **(a)** 78 | 1 | |
| | **(b)** $1.62 \times 10^{11}$ | 1 | |
| | **(c)** $5.32(2) \times 10^{21}$ | 2 | C1 for figs 5322 or $5.3....\times 10^{21}$ |
| **20** | **(a)** 4 : 25 | 1 | |
| | **(b)** 2 : 5 | 1 | |
| | **(c)** 7.5 | 2 | M1 for $\frac{3}{CD} = \frac{2}{5}$ or better |

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| | | | |
|---|---|---|---|
| **21** | **(a)** 22 – 3n | 2 | B1 for –3n soi |
| | **(b)** **(i)** $(2x – 5y)(2x + 5y)$ | 1 | |
| | **(ii)** $(5a – 2)(x – a)$ | 2 | M1 for the correct extraction of a common factor at any stage |
| **22** | **(a)** Correct distance/time graph | 3 | B2 for any two correct lines<br>or $L_1$ (10 10,0) to (a, 6), gradient m,<br>$L_2$ (a, 6) to (b, 6)<br>$L_3$ (b, 6) to (11 00,0)<br>or (c, 0), gradient – m.<br>B1 for a horizontal line at d = 6<br>or a horizontal line, 14 mins, anywhere<br>or $\frac{6}{20}$ soi |
| | **(b)** **(i)** 10 48 | 1 | |
| | **(ii)** 4 | 1 | |
| **23** | **(a)** **(i)** $t^2 – 4t + 3 = 0$ correctly derived AG | 1 | Must see $(20t – 5t^2) = 15$ |
| | **(ii)** 1, 3 | 2 | C1 for one value correct , and no incorrect value given<br>M1 for $(t – 1)(t – 3)$ oe seen |
| | **(b)** 4 | 2 | M1 for $20t – 5t^2 = 0$ or better seen |
| **24** | **(a)** **(i)** 0.75 oe | 2 | M1 for $5 – 6x \pm 2 = 2x + 1$ soi |
| | **(ii)** $\frac{8}{15}$ oe | 2 | M1 for $\frac{5t}{2} = \frac{4}{3}$ or better |
| | **(b)** $x = 2 \quad y = –3$ | 3 | C2 for one correct www<br>M1 for elimination or substitution reaching such as $11x = k$ or $hx = 22$ or $11y = p$ or $qy = –33$ |

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