Cambridge
O Level

**Cambridge International Examinations**
Cambridge Ordinary Level

**MATHEMATICS (SYLLABUS D)** **4024/11**

Paper 1 **May/June 2016**

MARK SCHEME

Maximum Mark: 80

**Published**

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| Question | Answers | Mark | Part marks |
|---|---|---|---|
| **1 (a)** | 14 | 1 | |
| **(b)** | (0).45(0) | 1 | |
| **2 (a)** | $\frac{1}{24}$ oe | 1 | |
| **(b)** | $\frac{3}{7}$ cao | 1 | |
| **3 (a)** | 02 25 | 1 | |
| **(b)** | 3150 | 1 | |
| **4** | 530 | 2 * | **B1** for (1800 and 1270); or for 370 or 530 seen |
| **5** | 88 | 2 * | **M1** for $(4 \times 80 + 120)$, or better. |
| **6 (a)** | $3.4 \times 10^{-5}$ | 1 | |
| **(b)** | $0.42 \times 10^{-5}$ $33.7 \times 10^{-6}$ $0.034 \times 10^{-3}$ | 1 | Accept *correct* equivs. |
| **7** | 30; 8; 0.4 all three | **M1*** | **B1** for two of 30; 8; 0.4 |
| | 600 | **A1** | Ans. 600 ww, award **C1** |
| **8 (a)** | Acceptable kite | 1 | |
| **(b)** | Acceptable parallelogram | 1 | |
| **9** | $y \leqslant 3$ oe<br>$y \geqslant -x$ oe | 1<br>1 | **C1** for $y$ ... 3 oe and $y$ ... $-x$ oe, where '...' is the wrong inequality or = |
| **10** | $(x - 4)(3y + 5)$ | 2 * | **B1** for $5(x - 4)$, or $3y(x - 4)$, or $x(3y + 5)$, or $4(3y + 5)$. |
| **11 (a)** | $-10\frac{1}{2}$ oe | 1 | |
| **(b)** | 6 | 2 * | **B1** for $3 = 2$ '$x$' $- 9$ or for $\frac{x+9}{2}$ or $\frac{y+9}{2}$ |
| **12 (a)** | 3.6 oe | 1 | |
| **(b)** | 25 | 1 | |
| **(c)** | 1:250 000 | 1 | |

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|---|---|---|---|
| **13** | A correct method to eliminate one variable.<br><br>Both $x = -2$ and $y = -1.5$ www; | *<br>**M1**<br><br>**A2** | <br><br>Or **A1** for one correct or ft their value of $x$ or $y$ correctly evaluated in one equation<br>For $y$, accept –1.5, or $-1\frac{1}{2}$, or $-\frac{3}{2}$, only.<br>If [0] earned, then **C1** for a pair of values that satisfy either equation |
| **14** | Vol. of hemisphere = $\frac{2}{3}\times\pi\times3^3$ oe or $18\pi$<br>Vol. of cone = $\frac{1}{3}\times\pi\times3^2\times2$ or $6\pi$<br>$k = 12$ | **M1***<br>**M1***<br>**A1** | |
| **15 (a)** | 4.5 oe | 2 * | **M1** for $8 = k4^2$ oe or $8 \div 4^2 = y \div 3^2$ oe |
| **(b)** | 7.5 or any equiv. | 1 | |
| **16 (a)** | 10° | 1 | |
| **(b)** | 20° | 1 | |
| **(c)** | 60° | 1 | |
| **17 (a)** | 10, 12 | 1 | |
| **(b)** | $2n + 2$ | 1 | |
| **(c)** | 99 | 2 * | **M1** for *their* (b) = 200 |
| **18 (a)** | Vertical axis label should be 'Frequency density' or heights should be 3, 8, 10, 2. | 1 | |
| **(b)** | Rectangles with same bases as in (a), with heights 3, 8, 10, 2.<br>Vertical label 'Frequency density' and a suitable scale. | 3 * | **C2** for 4 bars correct, with no label or incorrect scale on vertical axis<br>or<br>for 3 bars correct with 'Frequency density' label and numbered linear scale.<br><br>**C1** for numbers 3, 8, 10, 2; or 'Frequency density' label or for 3 bars correct |
| **19 (a)** | 40° | 1 | |
| **(b)** | 140° | 1 | |

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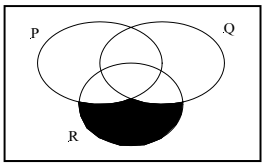
| Question | Answers | Mark | Part marks |
|---|---|---|---|
| **(c)** | 50° | 1 | |
| **(d)** | 40° | 1 | |
| **20 (a)** | 0 | 1 | |
| **(b)** | 1 | 1 | |
| **(c)** | 1.6 oe | 2* | **M1** for $(11 \times 1 + 9 \times 2 + 7 \times 3 + 6 \times 4 + 1 \times 6)/50$ |
| **21 (a)** | $2^2 \times 5^3$ | 1 | |
| **(b) (i)** | $p = 5$ and $q = 4$ | 1 | |
| **(ii)** | $p = -3$ and $q = 0$ | 1 | |
| **(iii)** | $p = 8$ and $q = 4$ | 1 | |
| **22 (a)** | 101° to 103° | 1 | |
| **(b) (i)** | Circular arc, centre $B$, radius 4 cm. | 1 | |
| **(ii)** | Line parallel to $AC$, 2 cm away. | 1 | |
| **(c)** | $AP$ = 6.2 to 6.6 cm | 1 | |
| **23 (a)** |  | 1 | |
| **(b) (i)** | 24 | 1 | |
| **(ii)** | 8 | 1 | |
| **(iii)** | 22 or 26 or 30 | 1 | |
| **24 (a) (i)** | $\frac{20}{T}$ oe | 1 | |
| **(ii)** | 5 | 1 | |
| **(b) (i)** | 15 | 1 | |
| **(ii)** | Curve, concave down, from (0, 0) to ($T$, 150) | 1 | |
| **25 (a) (i)** | $\mathbf{p} - \mathbf{q}$ | 1 | |
| **(ii)** | $3\mathbf{p} - 4\mathbf{q}$ | 1 | |

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| (iii) | $9\mathbf{p} - 9\mathbf{q}$ | 2 * | **B1** ft for a correct unsimplified form seen<br>or correct route seen |
| (b) | 1:8 | 1 | |
| 26 (a) (i) | 0 | 1 | |
| (ii) | $\frac{3}{7}$ | 1 | |
| (b) | $\frac{2}{7}$ oe | 1 | |
| (c) | $\frac{11}{14}$ oe | 2* | **M1** for $\frac{1}{2}\times 1 + \frac{1}{2}\times\frac{4}{7}$ |

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