

# Mark Scheme (Results)

## January 2008

**GCE O Level**

**O Level Mathematics B (7361\_01)**

## Paper 1

**SC:** -25 followed by 36 award B1, B0

1674 or  $2 \times 3^3 \times 31$  B1 **2**

*Penalise missing label(s) once only*

$$x + \frac{4}{x^4} \quad \text{or} \quad x + 4x^{-4} \qquad \text{A1} \qquad \mathbf{2}$$

|           |                             |                     |    |          |
|-----------|-----------------------------|---------------------|----|----------|
| <b>6.</b> | $\frac{\text{integer}}{10}$ | $(integer \leq 10)$ | M1 |          |
|           | $\frac{7}{10}$              | or 0.7              | A1 | <b>2</b> |

|                                             |                                                                                                             |        |   |   |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------|---|---|
| 7.                                          | 150° or $\frac{5\pi}{6}$                                                                                    | B1     |   |   |
|                                             | -0.866 (or better)                                                                                          | B1     |   | 2 |
| SC: -0.87 or better on its own earns B1, B0 |                                                                                                             |        |   |   |
| 8.                                          | $\frac{\pi}{2}$ , $\sqrt{8}$                                                                                | B1, B1 |   | 2 |
| 9.                                          | (a) line of symmetry drawn                                                                                  | B1     | 1 |   |
|                                             | (b) kite rotated 270° clockwise                                                                             | B1     | 1 | 2 |
| 10.                                         | $\frac{56}{360} \times \pi \times 5^2$ or $\frac{1}{2} \times 25 \times 0.977$                              | M1     |   |   |
|                                             | 12.2                                                                                                        | A1     |   | 2 |
| 11.                                         | Either $15 a^2$ or $\frac{5}{b}$                                                                            | B1     |   |   |
|                                             | $15 a^2 + \frac{5}{b}$ or $5(3a^2 + \frac{1}{b})$                                                           | B1     |   | 2 |
| Alternative Method:                         |                                                                                                             |        |   |   |
|                                             | $15 a^2b + 5$                                                                                               | B1     |   |   |
|                                             | $\frac{15 a^2b + 5}{b}$ or $\frac{5(3 a^2b + 1)}{b}$                                                        | B1     |   |   |
| 12.                                         | (a) 6 Km line drawn with correct angle                                                                      | B1     |   |   |
|                                             | 8 Km line drawn with correct angle                                                                          | B1     | 2 |   |
|                                             | (b) 7.2 ± 0.1 Km                                                                                            | B1     | 1 | 3 |
| 13.                                         | -4 - 2 ≤ 3x OR 3x ≤ 11 - 2                                                                                  | B1     |   |   |
|                                             | - 2 ≤ x                                                                                                     | B1     |   |   |
|                                             | x ≤ 3                                                                                                       | B1     |   | 3 |
| 14.                                         | (a) $\frac{125}{64}$ or $1\frac{61}{64}$                                                                    | B1     | 1 |   |
|                                             | (b) inversion of answer to (a)                                                                              | M1     |   |   |
|                                             | $(\frac{16}{25})^{3/2}$ , 64/125 but not 1/(125/64) or simply the inversion of the candidate's (a)<br>0.512 | A1     | 2 | 3 |

|                                                                              |                                                               |                                    |   |          |
|------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------|---|----------|
| 15. (a)                                                                      | line drawn from A into the $\Delta$                           | B1                                 |   |          |
|                                                                              | line drawn correctly                                          | B1                                 | 2 |          |
| (b)                                                                          | correct shading                                               | B1                                 | 1 | <b>3</b> |
| <hr/>                                                                        |                                                               |                                    |   |          |
| 16.                                                                          | 260°                                                          | B1                                 |   |          |
|                                                                              | 1 unit = 26°                                                  | B1 ft                              |   |          |
|                                                                              | <b>Reject:</b> 10 or 36                                       |                                    |   |          |
|                                                                              | 26°, 78°, 156°                                                | B1 (2 correct)<br>B1 (all correct) |   | <b>4</b> |
| <b>SC:</b> Two correct angles only with no working seen...<br>B1, B1, B1, B0 |                                                               |                                    |   |          |
| <hr/>                                                                        |                                                               |                                    |   |          |
| 17.                                                                          | $12600 \times \frac{90}{100}$ (= 11340)                       | M1                                 |   |          |
|                                                                              | "11340" $\times \frac{95}{100}$ (= 10773)                     | M1 DEP                             |   |          |
|                                                                              | $\frac{12600 - "10773"}{12600} \times 100$                    | M1 DEP                             |   |          |
|                                                                              | 14.5 %                                                        | A1                                 |   | <b>4</b> |
|                                                                              |                                                               |                                    |   |          |
| <hr/>                                                                        |                                                               |                                    |   |          |
| 18. (a)                                                                      | either $\angle CRD = 110^\circ$ ( $\angle$ on st. line)       | B1                                 |   |          |
|                                                                              | $\angle ACD = 40^\circ$                                       | B1                                 |   |          |
|                                                                              | <b>or</b> $\angle ACD = 40^\circ$ (ext $\angle$ of $\Delta$ ) | B1, B1                             |   |          |
|                                                                              | correct answer only                                           | B0, B1                             | 2 |          |
|                                                                              |                                                               |                                    |   |          |
| (b)                                                                          | either $\angle DBC = 50^\circ$ (alt seg.)                     |                                    |   |          |
|                                                                              | or $\angle BAD = 80^\circ$ (alt seg.)                         |                                    |   |          |
|                                                                              | or $\angle BCD = 100^\circ$ (alt seg.)                        | B1                                 |   |          |
| <b>IF</b> $\angle RAD = 50^\circ$ (alt segment) no B yet until...            |                                                               |                                    |   |          |
| Another 'useful' angle found i.e. $\angle CBD = 50^\circ$                    |                                                               |                                    |   |          |
| <b>THEN</b> first B mark earned.                                             |                                                               |                                    |   |          |
|                                                                              | $\angle ACB = 60^\circ$                                       | B1                                 |   |          |
|                                                                              | correct answer only                                           | B0, B1                             | 2 | <b>4</b> |

|     |                                                                          |                                        |       |        |
|-----|--------------------------------------------------------------------------|----------------------------------------|-------|--------|
| 19. | (a) $\begin{pmatrix} -6 \\ 8 \end{pmatrix}$                              | B2 (-1ee00)                            | 2     |        |
|     | (b) $\sqrt{-6''^2 + 8''^2}$<br>10                                        | M1<br>A1                               | 2     | 4      |
| 20. | $V = k r^3$                                                              | (or $V: 64V = r^3: R^3$ )              | (o.e) | M1     |
|     | $64V = kR^3$                                                             | (or $\frac{1}{64} = \frac{r^3}{R^3}$ ) | (o.e) | M1 DEP |
|     | $R^3 = 64r^3$                                                            |                                        | (o.e) | M1 DEP |
|     | $R = 4r$                                                                 |                                        |       | A1 4   |
| 21. | (a) Triangle Q                                                           | B2 (-1ee00)                            | 2     |        |
|     | (b) Triangle R                                                           | B2 ft (-1ee00)                         | 2     | 4      |
| 22. | Balancing (no errors)                                                    | M1                                     |       |        |
|     | Elimination (one error max)                                              | M1 dep                                 |       |        |
|     | <b>Alternative method:</b>                                               |                                        |       |        |
|     | Making $x/y$ the subject (one sign error)                                | M1                                     |       |        |
|     | Substituting into 2 <sup>nd</sup> equation                               | M1 dep                                 |       |        |
|     | $x = -2$<br>$y = -3$                                                     | A1<br>A1                               |       | 4      |
| 23. | (a) $\pi \times 5 \times (\sqrt{12^2 + 5^2})$                            | (o.e)                                  | M1    |        |
|     | $65\pi$                                                                  | (c.a)                                  | A1    | 2      |
|     | (b) $65\pi \times 3^2$ or $c's(\sqrt{36^2 + 15^2}) \times 15 \times \pi$ |                                        | M1    |        |
|     | $585\pi$                                                                 |                                        | A1    | 2 4    |
| 24. | $x^2 + 2x - 8 = 0$                                                       | M1                                     |       |        |
|     | $(x + 4)(x - 2) = 0$                                                     | M1                                     |       |        |
|     | $A = (-4, 0)$                                                            | A1                                     |       |        |
|     | $B = (2, 0)$                                                             | A1                                     |       |        |
|     | $C = (0, -8)$                                                            | B1                                     |       | 5      |
| 25. | (a) 3 correct straight lines                                             | B1, B1 ft, B1 ft                       | 3     |        |
|     | (b) correct straight line                                                | B1                                     | 1     |        |
|     | (c) 1050(am) $\pm 1$ min                                                 | B1                                     | 1     | 5      |

|     |                                                                                                                                                                 |                                    |   |   |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---|---|
| 26. | (a) $2x + y = 6$ drawn                                                                                                                                          | B1                                 | 1 |   |
|     | (b) (1, 1), (1, 2), (1, 3), (1, 4)<br>(2, 1), (2, 2)                                                                                                            | B1 (2 correct)<br>B1(all correct)2 |   |   |
|     | (c) 2, 5                                                                                                                                                        | B1ft, B1ft                         | 2 | 5 |
|     |                                                                                                                                                                 |                                    |   |   |
| 27. | (a)                                                                                                                                                             |                                    |   |   |
|     | 1 2 0                                                                                                                                                           |                                    |   |   |
|     | 3 3 1                                                                                                                                                           |                                    |   |   |
|     | 3 1 2                                                                                                                                                           | B2 (-1 each incorrect row)         | 2 |   |
|     | (b) 0                                                                                                                                                           | B1                                 | 1 |   |
|     | (c) 3 (1 does not score)                                                                                                                                        | B1                                 | 1 |   |
|     | (d) $2 * x = 3$<br>$x = 1$                                                                                                                                      | B1                                 |   |   |
|     |                                                                                                                                                                 | B1                                 | 2 | 6 |
|     |                                                                                                                                                                 |                                    |   |   |
|     |                                                                                                                                                                 |                                    |   |   |
| 28. | (a) $\frac{4}{5}$ seen (o.e.)                                                                                                                                   | B1                                 |   |   |
|     | $\frac{4}{5} \times \frac{4}{5} \times \frac{1}{5}$                                                                                                             | M1                                 |   |   |
|     |                                                                                                                                                                 |                                    |   |   |
|     | $\frac{16}{125}$ or 0.128                                                                                                                                       | A1                                 | 3 |   |
|     | (b) $\frac{4}{5} \times \frac{1}{5} \times \frac{1}{5} + \frac{1}{5} \times \frac{1}{5} \times \frac{4}{5} + \frac{1}{5} \times \frac{4}{5} \times \frac{1}{5}$ | M1                                 |   |   |
|     | (at least two correct terms)                                                                                                                                    |                                    |   |   |
|     | all three terms                                                                                                                                                 | A1                                 |   |   |
|     | $\frac{12}{125}$ or 0.096                                                                                                                                       | A1                                 | 3 | 6 |
| 29. | (a) $\sin 65 = \frac{AF}{6}$ (o.e.)                                                                                                                             | M1                                 |   |   |
|     | 5.44                                                                                                                                                            | A1                                 | 2 |   |
|     | (b) $\sin 55 = \frac{"5.44"}{AD}$ (o.e.)                                                                                                                        | M1                                 |   |   |
|     | 6.64                                                                                                                                                            | A1                                 | 2 |   |
|     | a correct attempt to find the area of one triangle or quadrilateral in the diagram                                                                              | M1                                 |   |   |
|     | completely correct method                                                                                                                                       | M1 dep                             |   |   |
|     | 48.3 or 48.2                                                                                                                                                    | A1                                 | 3 | 7 |
|     |                                                                                                                                                                 |                                    |   |   |