

**CAMBRIDGE INTERNATIONAL EXAMINATIONS****Cambridge International General Certificate of Secondary Education****MARK SCHEME for the October/November 2015 series****0607 CAMBRIDGE INTERNATIONAL MATHEMATICS****0607/32****Paper 3 (Core), maximum raw mark 96**

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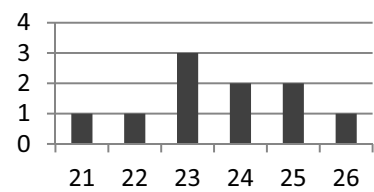
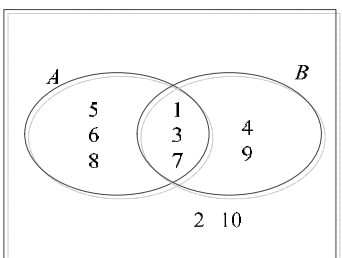
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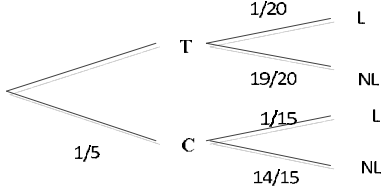
**Abbreviations**

|      |                            |
|------|----------------------------|
| cao  | correct answer only        |
| dep  | dependent                  |
| FT   | follow through after error |
| isw  | ignore subsequent working  |
| oe   | or equivalent              |
| SC   | Special Case               |
| nfww | not from wrong working     |
| soi  | seen or implied            |

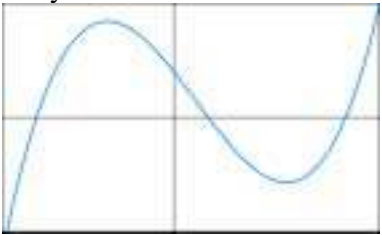
|          |                |                                              |                                                    |                                                                                                                                         |
|----------|----------------|----------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>1</b> | <b>(a)</b>     | 2, 3, 6, 9                                   | <b>1</b>                                           |                                                                                                                                         |
|          | <b>(b) (i)</b> | 26                                           | <b>1</b>                                           |                                                                                                                                         |
|          | <b>(ii)</b>    | 300.763                                      | <b>1</b>                                           |                                                                                                                                         |
|          | <b>(iii)</b>   | 12.8 or 12.76...                             | <b>2</b>                                           | <b>B1</b> for 37.4 seen                                                                                                                 |
|          | <b>(c) (i)</b> | 807.54 cao                                   | <b>1</b>                                           |                                                                                                                                         |
|          | <b>(ii)</b>    | 807.5 cao                                    | <b>1</b>                                           |                                                                                                                                         |
|          | <b>(iii)</b>   | 810 cao                                      | <b>1</b>                                           |                                                                                                                                         |
|          | <b>(iv)</b>    | 800 cao                                      | <b>1</b>                                           |                                                                                                                                         |
| <b>2</b> |                | $a = 48$<br>$b = 44$<br>$c = 44$<br>$d = 88$ | <b>1</b><br><b>1</b><br><b>1 FT</b><br><b>1 FT</b> | <b>FT</b> <i>their (b)</i><br><b>FT</b> $180 - 48 - \text{their } 44$<br>or $180 - \text{their (a)} + \text{their (b)}$                 |
| <b>3</b> | <b>(a)</b>     | 36                                           | <b>2</b>                                           | <b>M1</b> for 25 or 4 seen                                                                                                              |
|          | <b>(b)</b>     | 17.8 or 17.77...                             | <b>3</b>                                           | <b>M2</b> for $\frac{5300 - 4500}{4500} \times 100$ oe<br>or <b>M1</b> for $\frac{5300 - 4500}{4500}$ or $\frac{5300}{4500} \times 100$ |
| <b>4</b> | <b>(a) (i)</b> | 19.2                                         | <b>1</b>                                           |                                                                                                                                         |
|          | <b>(ii)</b>    | 18.4                                         | <b>1</b>                                           |                                                                                                                                         |
|          | <b>(b)</b>     | 0.5<br>0.4                                   | <b>1</b><br><b>1</b>                               | If 0 scored <b>SC1</b> if reversed                                                                                                      |
|          | <b>(c)</b>     | 64<br>64                                     | <b>1</b><br><b>1</b>                               |                                                                                                                                         |
|          | <b>(d)</b>     | 147.2[0]                                     | <b>2 FT</b>                                        | <b>M1</b> for <i>their</i> $64 \times [0].95$ and <i>their</i> $64 \times 1.35$ oe                                                      |

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| 5      | (a) (i) 5<br>(ii) 23<br>(iii) 23.5 oe<br>(iv) 23.6<br>(b)                                                                               | 1<br>1<br>1<br>1<br>2                        | <b>B1</b> for 4 correct bars                                                                                                                        |
| 6      | (a) 150<br>(b) 300<br>(c) [0].65<br>(d) [0].75                                                                                                                                                                           | 1<br>1 FT<br>2<br>1                          | <b>FT</b> <i>their</i> (a) $\times 2$<br><b>M1</b> for $2 \times 1.45 + [0].7[0]$ or better                                                         |
| 7      | (a) $F + 2M$<br>(b) 15<br>(c) 9                                                                                                                                                                                          | 2<br>2 FT<br>2 FT                            | <b>B1</b> for $2M$ seen<br><b>M1</b> for correct substitution in <i>their</i> formula<br><b>M1</b> for correct substitution in <i>their</i> formula |
| 8      | (a) <br><br>(b) (i) 1 3 7<br>(ii) 2 10<br>(iii) 4 9<br>(c) (i) $\frac{5}{10}$ oe<br>(ii) $\frac{3}{10}$ oe<br>(iii) $\frac{4}{10}$ oe | 2<br><br>1 FT<br>1 FT<br>1 FT<br>1<br>1<br>1 | <b>B1</b> for 2 correct regions                                                                                                                     |

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|    |     |                                                                                   |        |                                                                                                                                                                                                                                                                        |
|----|-----|-----------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9  | (a) | 33<br>46                                                                          | 1<br>1 |                                                                                                                                                                                                                                                                        |
|    | (b) | $n^2 - 3$                                                                         | 3      | <b>B2</b> for $n^2 \pm k$<br>or <b>M1</b> for finding second differences or any quadratic                                                                                                                                                                              |
| 10 | (a) |  | 3      | <b>B1</b> for each branch                                                                                                                                                                                                                                              |
|    | (b) | $\frac{4}{100}$ oe                                                                | 2      | <b>M1FT</b> for $\frac{4}{5} \times \text{their } \frac{1}{20}$                                                                                                                                                                                                        |
|    | (c) | $\frac{71}{75}$ or 0.947 or 0.9466...                                             | 3      | <b>M2</b> for $\frac{4}{5} \times \text{their } \frac{19}{20} + \text{their } \left( \frac{1}{5} \times \frac{14}{15} \right)$<br>or <b>M1</b> for $\frac{4}{5} \times \text{their } \frac{19}{20}$ or $\text{their } \left( \frac{1}{5} \times \frac{14}{15} \right)$ |
| 11 | (a) | Vertices at<br>(3, 1) (3, 2)<br>(4, 2) (4, 4)<br>(5, 4) (5, 1)                    | 2      | If 0 scored <b>SC1</b> for reflection in<br>$y = 1$ or $x = 0$                                                                                                                                                                                                         |
|    | (b) | Vertices at<br>(-5, -2) (-3, -1)<br>(-4, -1) (-4, 1)<br>(-5, -1) (-3, -2)         | 2      | If 0 scored <b>SC1</b> for translation of<br>$\begin{pmatrix} -2 \\ k \end{pmatrix}$ or $\begin{pmatrix} k \\ -3 \end{pmatrix}$ or $\begin{pmatrix} -3 \\ -2 \end{pmatrix}$                                                                                            |
|    | (c) | Vertices at<br>(1, -1) (1, -2)<br>(2, -2) (3, -1)<br>(2, -4) (3, -4)              | 2      | If 0 scored <b>SC1</b> for any rotation about (0, 0) or<br>a rotation of $180^\circ$                                                                                                                                                                                   |
| 12 | (a) | Points plotted correctly                                                          | 2      | <b>B1</b> for each point                                                                                                                                                                                                                                               |
|    | (b) | (5, 0)                                                                            | 2      | <b>B1</b> for each co-ordinate<br>If 0 scored <b>SC1</b> for (0, 5)                                                                                                                                                                                                    |
|    | (c) | 8.49                                                                              | 3      | <b>M1</b> for $\sqrt{6^2 + 6^2}$ or better<br><b>A1</b> for 8.485 to 8.486                                                                                                                                                                                             |
|    | (d) | -1                                                                                | 2      | <b>M1</b> for $\frac{\text{rise}}{\text{run}}$                                                                                                                                                                                                                         |
|    | (e) | $y = -x + 5$ oe                                                                   | 2 FT   | <b>M1</b> for $[y =] -x + k$ or $x + y = k$<br><b>FT</b> from (d)                                                                                                                                                                                                      |

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|           |                |                                                                                                           |             |                                                                                                                                                           |
|-----------|----------------|-----------------------------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>13</b> | <b>(a)</b>     | 72                                                                                                        | <b>1</b>    |                                                                                                                                                           |
|           | <b>(b)</b>     | 108                                                                                                       | <b>2</b>    | <b>M1</b> for $\frac{2(180 - \text{their } 72)}{2}$ or $180 - \frac{360}{5}$ oe<br>or <b>B1</b> for 54                                                    |
|           | <b>(c)</b>     | 4.13 or 4.129...                                                                                          | <b>2 FT</b> | <b>M1</b> for $\tan 54 = \frac{r}{3}$ oe <b>FT</b> $\frac{\text{their angle in (a)}}{2}$<br>or $\frac{\text{angle in (b)}}{2}$                            |
|           | <b>(d)</b>     | 61.9 – 62.[0]                                                                                             | <b>3 FT</b> | <b>M2</b> for $\left(\frac{1}{2} \times 6 \times \text{their } 4.13\right) \times 5$<br>or <b>M1</b> for $\frac{1}{2} \times 6 \times \text{their } 4.13$ |
| <b>14</b> | <b>(a)</b>     | Fully correct curve<br> | <b>2</b>    | <b>B1</b> for correct cubic shape (maximum then minimum)                                                                                                  |
|           | <b>(b) (i)</b> | (–4, 0) (1, 0) (5, 0)                                                                                     | <b>2</b>    | <b>B1</b> for 2 correct                                                                                                                                   |
|           | <b>(ii)</b>    | (0, 10)                                                                                                   | <b>1</b>    |                                                                                                                                                           |
|           | <b>(iii)</b>   | (3.27, –14.3)<br>or (3.270.., –14.28 to –14.27)                                                           | <b>2</b>    | <b>B1</b> for each co-ordinate                                                                                                                            |