NOVEMBER 2002

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK : 70

SYLLABUS/COMPONENT : 0580/2; 0581/2
MATHEMATICS
(EXTENDED)
* indicates that it is necessary to look in the working following a wrong answer

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| 1 | (a) 4 | Allow – 4  
(b) 4.5 | Allow – 4.5 |
| 2 | 25.8 | 2* | M1 for \(\frac{16 \times 100}{62}\) or \(100 - \frac{46 \times 100}{62}\) |
| 3 | ![Diagram of sets A and B with K] | 2 | B1 for A, B disjoint  
B1 for A, B subsets of K |
| 4 | 512.82 cao | 2* | M1 500 \(\div\) 0.975 or 500 \(\times\) 1.026 |
| 5 | \(\frac{1}{1000}, 0.11\%\), \(\frac{11}{1000}\) | 2* | M1 for conversions into decimals, percentages, SIF or fractions with identical denominators |
| 6 | \(\frac{-2\times^2}{5-x}\) | 2* | M1 \(2\times(5-x)\) \(-\) 10x or better, brackets essential |
| 7 | (a) \(\frac{1}{9}\)  
(b) \(1\frac{1}{2}\) | 1* | Allow 0.1 recurring only  
M1 for \(\frac{16}{9}\)  
Allow 4/3 or 1.3 recurring only  
If no marks scored allow SC1 for 0.111 and 1.33 |
| 8 | 100 cao | 3* | B1 for 385 or 3.85 seen  
M1 a distance \(+\) a speed |
| 9 | (a) | 2 | B1 poor quality rectangle |
|   | (b) rectangle | 1\(\sqrt{\text{ }}\) | must be a quadrilateral |
| 10 | (a) 8  
(b) 7.5  
(c) 6.5 | 1 |  
1 |  
1 |
| 11 | \(4.0 \times 10^7\) | 3* | M1 \(2 \times \pi \times 6.4 \times 10^6\)  
SC1 2.0 \(\times\) \(10^7\)  
\(4.0 \times 10^6\), \(4.02 \times 10^7\), \(4 \times 10^7\) score M1A1A0 |
| 12 | (a) \(71^\circ\)  
(b) \(168^\circ\) | 1* | B1 720 or M1 for \(\frac{1}{2} \text{("their 720" - 313 - (a))}\)  
2\(\sqrt{\text{ }}\) | M1 A1 \(\sqrt{\text{ }}\) for \(\frac{1}{2}(407 - (a))\) |
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| 13 | (a) 1.6  
(b) 19 | 1 | Allow — 1.6  
2* M1 for attempting to find the area under the graph |
| 14 | (a) 80°  
(b) 67°  
(c) 12° | 1 | 1√  
1√  
1√ | 147 — (a)  
79 — (b) |
| 15 | x = 1/4  
y = -1/5 | 4* | M1 multiplication M1 add or subtract A1 A1  
or M1 rearrange M1 correct substitution |
| 16 | (a) S  
3.5 km  
312° | 2 | -1 each item missing or wrong including the size  
of the angle (S and H interchanged is one error) |
|   | (b) 2.34 | 2* | M1 sin 42 = d/3.5 or cos 48 = d/3.5 |
| 17 |   | 3 | B1 x = 1  
B1 y = 2  
B1 x + y = 5 |
|   |   | 1√ | B1 R correctly placed for their lines but B0 if the  
line x + 5 = 5 is drawn with a positive gradient |
| 18 |   | 4 | B1 arc radius 5cm ± 1mm  
B1 perp. bisector, dep B1 with arcs, each correct  
by eye.  
B1 √ shading for a line between G and H and the  
arc, with boundaries complete |
| 19 | (a) x < 4.91 | 3* | M1 for 9/2 oe  
M1 for 11x/12 www  
can be implied by 4.9(1) or 54/11  
or M1 multiples of 60 — 8x > 6 + 3x  
M1 11x < 54 |
<p>|   | (b) (0),1,2,3,4 | 1√ | if possible |</p>
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<tr>
<th></th>
<th>Mark Scheme</th>
<th>Syllabus</th>
<th>Paper</th>
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<tbody>
<tr>
<td></td>
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<td>IGCSE Examinations – November 2002</td>
<td>0580; 0581</td>
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<tr>
<td>20</td>
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<td></td>
<td>(a) ( f^{-1}(x) = \frac{x + 1}{2} )</td>
<td>2</td>
<td></td>
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<td></td>
<td>(b) ( gf(x) = 4x^2 - 4x )  ( \text{oe} )</td>
<td>2*</td>
<td>( M1 ) for ((2x - 1)^2 - 1)</td>
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<td>21</td>
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<td>(a) ( \begin{pmatrix} -2 &amp; 1 \ -1 &amp; -1 \end{pmatrix} )</td>
<td>2*</td>
<td>-1 eeo  or ( M1 ) for subtracting from zero matrix</td>
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<td></td>
<td>(b) ( \begin{pmatrix} 1 &amp; 1 \ 3 &amp; -1 &amp; 2 \end{pmatrix} )</td>
<td>3*</td>
<td>( B1 ) for each diagonal of the adjoint matrix ( B1 ) for division by 3 or ( M1 ) for ( 2a - c = 1 ) and ( a + c = 0 ) (or similar) ( A1 ) each column</td>
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<td>22</td>
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<td></td>
<td>(a) 5</td>
<td>2*</td>
<td>( M1 ) for ( \sqrt{3^2 + 4^2} )</td>
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<tr>
<td></td>
<td>(b) 133°</td>
<td>3*</td>
<td>( B1 ) for bisecting isosceles triangle ( M1 ) for ( \sin x = 2.75/3 )  or ( M1 ) ( 5.5^2 = 3^2 + 3^2 - 2 \times 3 \times 3 \cos A ) ( M1 \cos A = - 12.(25)/18 )</td>
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<td>TOTAL</td>
<td>70</td>
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