This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners’ meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.
A INVESTIGATION COUNTING FACTORS

1 (a) (i) 2, 4, 8
(ii) \(2^1, 2^2, 2^3\) \(\quad 1\)

(b) \(3^0, 3^1, 3^2, 3^3\) \(\quad 1\)

2 (a) (i) \(p^1, p^2, p^3, p^4, p^5\) \(\quad 1\)
(ii) \(n + 1\) \(\quad 1\)

(b) 8 \(\quad 1\) C opportunity

3 (a)

<table>
<thead>
<tr>
<th>Powers of 5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(5^0)</td>
<td>(5^0)</td>
</tr>
<tr>
<td>(2^0\times 5^0 - 1 \times 1 = 1)</td>
<td>(2^0 \times 5^0 - 1 \times 5 = 5)</td>
</tr>
<tr>
<td>(2^1\times 5^1 - 2 \times 1 = 2)</td>
<td>(2^1 \times 5^1 - 2 \times 5 = 10)</td>
</tr>
<tr>
<td>(2^2\times 5^2 - 4 \times 1 = 4)</td>
<td>(2^2 \times 5^2 - 4 \times 5 = 20)</td>
</tr>
</tbody>
</table>

(b) multiply oe \(\quad 1\) must not be part of incorrect statement

(c) 24 \(\quad 1\) C opportunity

4 (a) (i) 6 soi \(\quad 1\)
(ii) 49 \(\quad 1\) FT their \((6 + 1)^2\), their 6 \(\neq 0\), 1 C opportunity C opportunity

(b) 29 \(\quad 1\)

5 1323 1701 3087 50421 \(\quad 3\) B2 for 3 numbers seen or for 4 numbers seen with extras

or B1 for 2 or 1 numbers seen

if 0 scored then

SC2 for \(3^{[1]} \times 7^5, 3^{[2]} \times 7^3, 3^{[3]} \times 7^2\) and \(3^{[5]} \times 7^{[1]}\) and no extras

or SC1 for \(3^{[1]} \times 7^5, 3^{[2]} \times 7^3, 3^{[3]} \times 7^2\) and \(3^{[5]} \times 7^{[1]}\) with extras

C opportunity
<table>
<thead>
<tr>
<th></th>
<th>Mark Scheme</th>
<th>Syllabus</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>(a) 2⁴ × 3¹⁺¹ × 7¹⁺¹ isw</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b) 20</td>
<td>1FT</td>
<td>FT only if indices are three positive integers soi C opportunity</td>
</tr>
<tr>
<td>7</td>
<td>60 90 150</td>
<td>2</td>
<td>B1 for 2 or 1 correct numbers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If 0 scored M1 for (2^2 \times 3 \times 5), (2 \times 3^2 \times 5), (2 \times 3 \times 5^2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C opportunity</td>
</tr>
<tr>
<td>Communication seen in 3 of the following: 2(b), 3(c), 4(a)(ii), 4(b), 5, 6(b), 7</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>
### MODELLING TIDES

#### 1 (a) (i)
![Graph showing tide patterns](image)

(ii) 120

(b) 36

(c) \( \frac{360}{b} \) or 360 : \( b \)

2 B1 correct maximum and minimum
B1 correct period over their domain

1

#### 2 (a)

12 [hours]

(b) amplitude or maximum = 1.2 soi

\[
\frac{360}{12} \text{ soi or } \frac{360}{30} = 12 \text{ soi}
\]

(c) \( 1.2\sin(30t)° + 2 \) isw

1

(d) (i) 

<table>
<thead>
<tr>
<th>[0]753</th>
<th>or</th>
<th>0754</th>
</tr>
</thead>
<tbody>
<tr>
<td>1007</td>
<td>or</td>
<td>1006</td>
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</tbody>
</table>

2 B1 for each
B1 for each
M1 for 7.8 to 8.0 and 10.0 to 10.2 seen

if 0 scored then SC1 for 473 and 607 minutes as final answer

(ii) 1953  2207 1FT

C opportunity

FT their times + 12

#### 3 (a)

Any two valid comments about the difference in height over a range of time

For example:

- [more] close between 4 and 11 oe
- not close before 4 and after 11 oe

SC1 for a comment such as \( H \) is higher than \( D \) until about 11 when they are the same and then \( D \) is higher than \( H \)

(b) 0.022t^3 - 0.403t^2 + 1.9t + 0.4

1
<table>
<thead>
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<td>IGCSE – May/June 2014</td>
<td>0607</td>
<td>61</td>
</tr>
</tbody>
</table>

| 4 | 1.2\(\sin(29t)\)° + 2 | 2FT | FT from 2(c)  
M1 for \(\frac{360}{12} \) oe or \(\frac{360}{12.4[...] \) oe or \(\frac{360}{b} = 12.4[...] \) oe  
SC1 1.2\(\sin(29.4t)\)° + 2  
C opportunity |
| 5 | 1.2\(\sin(their29(t - \frac{5}{6}))\)° + 2 or 1.2\(\sin(their29t - 24.2)\)° + 2 isw | 2FT | FT from 4  
B1 for \(\frac{5}{6} \) or 0.83 oe seen  
If 0 scored then  
SC1 if inside brackets missing  
or SC1 for \(t - \frac{5}{12} \) or \(t - 0.416 \) or \(t - 0.8[...] \) in the full expression. |

Communication seen in one of the following questions: 2 (d), 4