Instructions

• Use black ink or ball-point pen.
• Answer all questions.
• Answer the questions in the spaces provided – there may be more space than you need.
• Diagrams are NOT accurately drawn, unless otherwise indicated.
• You must show all your working out.

Information

• The marks for each question are shown in brackets – use this as a guide as to how much time to spend on each question.

Advice

• Read each question carefully before you start to answer it.
• Keep an eye on the time.
• Try to answer every question.
• Check your answers if you have time at the end
1.(a) Complete the table of values for \( y = 2^x \)

<table>
<thead>
<tr>
<th>( x )</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b) On the grid, draw the graph of \( y = 2^x \)
2.(a) Complete the table of values for $y = \sin(x)$

<table>
<thead>
<tr>
<th>$x$</th>
<th>0</th>
<th>30</th>
<th>60</th>
<th>90</th>
<th>120</th>
<th>150</th>
<th>180</th>
<th>210</th>
<th>240</th>
<th>270</th>
<th>300</th>
<th>330</th>
<th>360</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

(b) On the grid, draw the graph of $y = \sin(x)$
3. (a) Complete the table of values for \( y = \cos(x) \) 

<table>
<thead>
<tr>
<th>( x )</th>
<th>0</th>
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<th>60</th>
<th>90</th>
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</tbody>
</table>

(b) On the grid, draw the graph of \( y = \cos(x) \)
4. Here is a sketch of the curve $y = \sin x^\circ$ for $0 \leq x \leq 360$

\begin{align*}
\text{a) Given that } &\sin 30^\circ = \frac{1}{2}, \text{ write down the value of:} \\
\text{i) } &\sin 150^\circ \\
\text{................. (1)} \\
\text{ii) } &\sin 330^\circ \\
\text{................. (1)}
\end{align*}
5. Here is a sketch of the curve $y = \cos x^\circ$ for $0 \leq x \leq 360$

![Graph of $y = \cos x^\circ$ for $0 \leq x \leq 360$.]

a) Use the graph to find estimates of the solutions, in the interval $0 \leq x \leq 360$, of the equation:

i) $\cos(x) = -0.4$ ................................ (2)

ii) $4\cos(x) = 3$ ................................ (2)
This sketch shows part of the graph with equation \( y = pq^x \), where \( p \) and \( q \) are constants.

The points with coordinates (0, 8), (1, 18) and (1.5, \( k \)) lie on the graph. Calculate the values of \( p \), \( q \) and \( k \).
7. The depth of water, d metres, at the entrance to a harbour is given by the formula: \( d = 5 - 4 \sin(30t) \) where \( t \) is the time in hours after midnight on one day.

a) On the axes below, draw the graph of \( d \) against \( t \) for \( 0 \leq t \leq 12 \).  

b) Find the two values of \( t \), where \( 0 \leq t \leq 24 \), when the depth is least.

\[ ............. \text{ and } ............. \]