Each problem is worth 5 points. Clear and complete justification is required for full credit.

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>f(x)</td>
<td>4</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>g(x)</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

1. Use the table above to evaluate
   a) \( f \circ g(2) = f(g(2)) = f(4) = 2 \)
   b) \( g \circ f(2) = g(f(2)) = g(6) = 5 \)

2. Find an exponential function for the form \( f(x) = C \cdot a^x \) passing through the points \((0,3)\) and \((2,12)\).

   Since it goes through \((0,3)\):
   \[
   (3) = C \cdot a^0 \\
   \therefore C = 3
   \]

   Since it goes through \((2,12)\):
   \[
   (12) = 3 \cdot a^2 \\
   4 = a^2 \\
   \therefore a = 2
   \]

   \( f(x) = 3 \cdot 2^x \)
3. Evaluate \( \log_2 \frac{1}{4} \) exactly.

\[
\log_2 \frac{1}{4} = \log_2 2^{-2} = -2
\]

means "What's the exponent you'd put on 2 to get..."

4. Evaluate \( \ln \sqrt{e} \) exactly.

\[
\ln \sqrt{e} = \log_e e^{\frac{1}{2}} = \frac{1}{2}
\]

means "What's the exponent you'd put on e to get..."