1. (6 points) The table gives the values of a function $f$.

<table>
<thead>
<tr>
<th>$x$</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f(x)$</td>
<td>15</td>
<td>9</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

(a) If $f$ could be a linear function, find a possible formula for $f$. If not, explain why not.

The function is not linear because \( \frac{\Delta y}{\Delta x} \) is not constant.

\[
\frac{15-9}{-2} = -3 \neq \frac{9-6}{-2} = -\frac{3}{2}
\]

(b) If $f$ could be an exponential function, find a possible formula for $f$. If not, explain why not.

\[
\frac{9}{15} = \frac{3}{5} \neq \frac{6}{3} = 2 \neq \frac{2}{3} = 2
\]

The function is not exponential because ratios of $y$-values over equally spaced $x$-values are not constant --- i.e., not a constant Do not change.

2. (8 points) For the periodic function with the graph given below, determine:

(a) the period of the function: 6

(b) the amplitude of the function: 2

(c) a possible formula for the function. $f(x) = 2 \cos \left( \frac{\pi}{6} x \right)$