Limits (section 1.8)

1. Let \( f(x) = \frac{x^2 - 4}{x - 2} \)
   a. Complete the following table:
   \[
   \begin{array}{cccccccc}
   x & 1.9 & 1.99 & 1.999 & 1.9999 & 2.0001 & 2.001 & 2.01 & 2.1 \\
   f(x) & & & & & & & & \\
   \end{array}
   \]

   b. Make a conjecture about the value of \( \lim_{x \to 2} f(x) \).

   c. Graph the function to see if it is consistent with your answers in parts a and b. Show work.

   d. Find an interval for \( x \) near 0 such that the difference between your conjectured limit and the value of the function is less than 0.01. (In other words, find a window of height 0.02 such that the graph exits the sides of the window and not the top or bottom of the window.)
2. Let \( f(x) = \frac{\sin(2x)}{x} \)

a. Complete the following table:

<table>
<thead>
<tr>
<th>x</th>
<th>.1</th>
<th>.01</th>
<th>.001</th>
<th>.0001</th>
<th>-.0001</th>
<th>-.001</th>
<th>-.01</th>
<th>-.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>f(x)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. Make a conjecture about the value of \( \lim_{x \to 0} f(x) \).

c. Graph the function to see if it is consistent with your answers in parts a and b. Show work.

d. Find an interval for \( x \) near 0 such that the difference between your conjectured limit and the value of the function is less than 0.01. (In other words, find a window of height 0.02 such that the graph exits the sides of the window and not the top or bottom of the window.)