3.) (12 pts) (a) On the axes below, sketch a graph of a single continuous function, \( y = f(x) \), which has all of the following features:

- \( f(0) = -3 \)
- \( f(-2) = 0 \) and \( f(3) = 0 \)
- \( f \) is decreasing for \( x < 0 \)
- \( f \) is increasing for \( x > 0 \)
- \( f \) is concave up for \( x < 2 \)
- \( f \) is concave down for \( x > 2 \)
- \( f(x) \to 4 \) as \( x \to \infty \)

(b) Is the function you drew in part (a) invertible? Explain why or why not.

4.) Data from three functions is shown in the table below. One function is linear, one is a power function, and one is neither of these.

<table>
<thead>
<tr>
<th>( x )</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>( f(x) )</td>
<td>15.6</td>
<td>20.2</td>
<td>24.2</td>
<td>29.3</td>
<td>35.4</td>
</tr>
<tr>
<td>( g(x) )</td>
<td>17.5</td>
<td>20.2</td>
<td>22.4</td>
<td>24.8</td>
<td>27.2</td>
</tr>
<tr>
<td>( h(x) )</td>
<td>4.4</td>
<td>1.0</td>
<td>4.4</td>
<td>17.6</td>
<td>39.6</td>
</tr>
</tbody>
</table>

(a) (6 pts) Determine a formula for the linear function. (Be certain to use the appropriate function name — i.e., \( f \), \( g \), or \( h \) from the table.)

\[ f \] is linear

\[ m = \frac{24.2 - 15.6}{2 - 0} = 4.3 \]

\( y \)-intercept is \( b = 15.6 \)

\[ f(x) = 15.6 + 4.3x \]

(b) (6 pts) Determine a formula for the power function. [Again use the correct function name.]

\[ g \] cannot be a power function, (since \( f(16) = 20 \))

\[ 15.6 = k \cdot (4)^2 = 16 \cdot k \]

\[ k = \frac{15.6}{16} = 0.975 \]

\[ f(x) = 1.1 \cdot x^2 \]

\[ k = 1.1 \]