2.1 Radical Functions and Transformations:

Radical Notation:

\( \sqrt[n]{a} \) is the (principle) \( n \)th root of \( a \).

\( a \) is the **radicand**

\( n \) is the **index** (or order) of the radical

Example: Solve to 3 decimal places

1.) \( x^2 = 4 \)

2.) \( x^5 = -8 \)

3.) \( x^{32} = -4 \)

Graphing Radicals in the form \( y = a\sqrt{b(x - c)} + d \)

**Note**: Consider the key points of a \( y = \sqrt{x} \) function

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>( \sqrt{1} )</td>
</tr>
<tr>
<td>4</td>
<td>( \sqrt{4} )</td>
</tr>
<tr>
<td>9</td>
<td>( \sqrt{9} )</td>
</tr>
</tbody>
</table>

Example: Graph and state the transformation:

a.) \( y = \sqrt{x} \) and \( y = \sqrt{x + 2} - 1 \)
b. \( y = \sqrt{x} \) and \( y = -3\sqrt{x} \)

c. \( y = \sqrt{x} \) and \( y = \sqrt{2x + 6} \)
d.) $y = \sqrt{x}$ and $y = 3\sqrt{4x - 2} + 1$
Determine a Radical Function from a Graph:

![Graph of a radical function]

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