1.10 Geometric Meanies

A Practice Understanding Task

Each of the tables below represents a geometric sequence. Find the missing terms in the sequence, showing your method.

Table 1

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>3</td>
<td>6</td>
<td>12</td>
</tr>
</tbody>
</table>

\[
\frac{12}{3} = 4 \quad \sqrt[4]{12} = 2 \quad r = \pm 2
\]

Is the missing term that you identified the only answer? Why or why not?

No, -6

Table 2

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>7</td>
<td>125</td>
<td>175</td>
<td>875</td>
</tr>
</tbody>
</table>

\[
\frac{875}{7} = 125 \quad \sqrt[3]{125} = 5
\]

Are the missing terms that you identified the only answers? Why or why not?

Yes, odd index

Table 3

<table>
<thead>
<tr>
<th>x</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>6</td>
<td>12</td>
<td>24</td>
<td>48</td>
<td>96</td>
</tr>
</tbody>
</table>

\[
\frac{48}{6} = 16 \quad \sqrt[4]{16} = 2 \quad r = \pm 2
\]

Are the missing terms that you identified the only answers? Why or why not?

No, -12, 24, -48
Table 4

<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>y</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>972</td>
</tr>
</tbody>
</table>

\[
\frac{972}{4} = 243 \quad \sqrt[4]{243} = 3 \quad r = 3
\]

Are the missing terms that you identified the only answers? Why or why not?

Yes

A. Describe your method for finding the geometric means.

\[ \sqrt[n]{\frac{f(n)}{f(1)}} \]

B. How can you tell if there will be more than one solution for the geometric means?

More than one solution → even index root
Only one answer → odd index root