**8-4A Lesson Master**

**Questions on SPUR Objectives**

**SKILLS Objective C**
In 1–6, evaluate without using a calculator.

1. \( \sqrt{8} = \) __________
2. \( \sqrt{81} = \) __________
3. \( \sqrt{1} = \) __________
4. \( \sqrt{\frac{1}{32}} = \) __________
5. \( \sqrt{\frac{81}{16}} = \) __________
6. \( \sqrt{64} = \) __________

In 7–9, approximate to the nearest hundredth.

7. \( \sqrt[3]{17} = \) __________
8. \( \sqrt[3]{121} = \) __________
9. \( \sqrt[3]{417.9} = \) __________

**PROPERTIES Objective G**

10. a. On a CAS, find all complex fourth roots of 2401. __________
    b. Which of your answers from Part a is equal to \( \sqrt[4]{2401} \)? __________

11. If \( n \) is a positive integer and \( n \geq 2 \), for what values of \( x \) is \( \sqrt[4]{x} = x^\frac{1}{4} \)? __________

12. If \( x > 0 \) and \( y > 0 \), simplify \( \sqrt[4]{81x^{12}y^{28}} \). __________

13. What is the geometric mean of positive real numbers \( a, b, c, d, \) and \( e \)? __________

**USES Objective I**

14. The table below gives the estimated 2007 populations of the New England states, in millions. Find the geometric mean of their populations.

<table>
<thead>
<tr>
<th>State</th>
<th>Connecticut</th>
<th>Maine</th>
<th>Massachusetts</th>
<th>New Hampshire</th>
<th>Rhode Island</th>
<th>Vermont</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (millions)</td>
<td>3.5</td>
<td>1.3</td>
<td>6.4</td>
<td>1.3</td>
<td>1.1</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Source: [http://www.census.gov](http://www.census.gov)

15. Recall that the power \( p \) generated by a windmill is directly proportional to the cube of the wind speed \( w \), so \( p = kw^3 \). Suppose a particular small windmill generates 1.6 kilowatts of power in an 8 mph wind. How strong must the wind be to generate at least 1.0 kilowatts of power?