Cubes and Cube Roots Worksheet

Name __________________________ Date ________ Period ________

What does it mean to “cube” a number?

Fill in the chart:

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>$1^3$</td>
<td>$2^3$</td>
<td>$3^3$</td>
<td>$4^3$</td>
<td>$5^3$</td>
</tr>
<tr>
<td>$6^3$</td>
<td>$7^3$</td>
<td>$8^3$</td>
<td>$9^3$</td>
<td>$10^3$</td>
</tr>
</tbody>
</table>

The inverse of cubing a number is....

<p>| | | | |</p>
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</thead>
<tbody>
<tr>
<td>$\sqrt[3]{8}$</td>
<td>$\sqrt[3]{512}$</td>
<td>$\sqrt[3]{125}$</td>
<td>$\sqrt[3]{64}$</td>
</tr>
</tbody>
</table>

How do you find the cube root of a non-perfect cube?

Example: what is the cube root of 30?

Well, $3 \times 3 \times 3 = 27$ and $4 \times 4 \times 4 = 64$, so we can guess the answer is between 3 and 4.

- Let’s try 3.5: $3.5 \times 3.5 \times 3.5 = 42.875$
- Let’s try 3.2: $3.2 \times 3.2 \times 3.2 = 32.768$
- Let’s try 3.1: $3.1 \times 3.1 \times 3.1 = 29.791$

We are getting closer, but very slowly ... at this point, I get out my calculator and it says:

$3.072325059538508665877662475224$

... but the digits just go on and on, without any pattern. So even the calculator’s answer is **only an approximation**!

Practice: What 2 perfect cubes does $\sqrt[3]{89}$ fall between?

Practice: Rounded to the nearest hundredth, what is the $\sqrt[3]{102}$?
Assignment:

Write the square or cube of each number.

A. \(4^2 = \phantom{000} \quad 9^2 = \phantom{000} \quad 3^3 = \phantom{000} \)

B. \(6^2 = \phantom{000} \quad 7^2 = \phantom{000} \quad 15^3 = \phantom{000} \)

C. \(10^2 = \phantom{000} \quad 5^3 = \phantom{000} \quad 14^3 = \phantom{000} \)

D. \(20^2 = \phantom{000} \quad 24^3 = \phantom{000} \quad 19^3 = \phantom{000} \)

E. \(8^3 = \phantom{000} \quad 13^2 = \phantom{000} \quad 48^2 = \phantom{000} \)

F. \(17^2 = \phantom{000} \quad 25^3 = \phantom{000} \quad 37^2 = \phantom{000} \)

Write the square root.

G. \(36 = \sqrt{6^2} \quad 64 = \phantom{000} \quad 81 = \phantom{000} \quad 25 = \phantom{000} \quad 324 = \phantom{000} \quad 529 = \phantom{000} \)

H. \(100 = \phantom{000} \quad 49 = \phantom{000} \quad 4 = \phantom{000} \quad 16 = \phantom{000} \quad 121 = \phantom{000} \quad 1,600 = \phantom{000} \)

I. \(400 = \phantom{000} \quad 225 = \phantom{000} \quad 625 = \phantom{000} \quad 144 = \phantom{000} \quad 900 = \phantom{000} \quad 2,500 = \phantom{000} \)

Write the cube root.

J. \(125 = \sqrt[3]{5^3} \quad 1,000 = \phantom{000} \quad 64 = \phantom{000} \quad 27 = \phantom{000} \quad 8 = \phantom{000} \quad 216 = \phantom{000} \)

K. \(.512 = \phantom{000} \quad 1,728 = \phantom{000} \quad 2,744 = \phantom{000} \quad 343 = \phantom{000} \quad 8,000 = \phantom{000} \quad 6,859 = \phantom{000} \)

Use the chart on the back to determine which two whole numbers the non-perfect cube falls between:

\(\sqrt[3]{200} \) is between \phantom{000} and \phantom{000} .

\(\sqrt[3]{4} \) is between \phantom{000} and \phantom{000} .

\(\sqrt[3]{1.058} \) is between \phantom{000} and \phantom{000} .

\(\sqrt[3]{65} \) is between \phantom{000} and \phantom{000} .

\(\sqrt[3]{2.201} \) is between \phantom{000} and \phantom{000} .

Using your calculator and rounding to the nearest hundredth, write the cube root:

\(\sqrt[3]{200} = \phantom{000} \)

\(\sqrt[3]{4} = \phantom{000} \)

\(\sqrt[3]{1.058} = \phantom{000} \)

\(\sqrt[3]{65} = \phantom{000} \)

\(\sqrt[3]{2.201} = \phantom{000} \)