

Math Lab: Powers and Radicals

Materials

- scientific calculator
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Procedure

Follow the steps to complete each chart to determine the relationship between a power and a radical.

Part A

Complete the chart by doing the following:

Step 1: Raise each number in the first column to the exponent $\frac{1}{2}$ and then use your calculator to evaluate the power that results. Show your work and answer in the second column.

Step 2: Determine the square root of each number in the first column. Show your work and answer in the third column.

In the final row of the chart, choose another positive number and apply steps 1 and 2 to it.

x	$x^{\frac{1}{2}}$	$\sqrt{x}$
1		
4		
25		
576		

Part B

Complete the chart by doing the following:

Step 3: Raise each number in the first column to the exponent $\frac{1}{3}$ and then use your calculator to evaluate the power that results. Show your work and answer in the second column.

Step 4: Determine the cube root of each number in the first column. Show your work and answer in the third column.

In the final row of the chart, choose another number and apply steps 3 and 4 to it.

x	$x^{\frac{1}{3}}$	$\sqrt[3]{x}$
1		
8		
27		
343		

Lab Analysis

1. What did you discover about the numbers in the second and third columns?
2. Why did the self-selected number in the chart in Part A have to be positive, whereas there was no such restriction on the number selected in the chart for Part B?
3. Do you get the same results if the number you select is not a perfect square or a perfect cube?
4. What do you think the exponents $\frac{1}{4}$ and $\frac{1}{5}$ mean?
5. How would you write $47^{\frac{1}{5}}$ as a radical?