Math Lab: Powers and Radicals Possible Solutions

Part A

x	$x^{\frac{1}{2}}$	$\sqrt{x}$
1	$1^{\frac{1}{2}} = 1$	$\sqrt{1} = 1$
4	$4^{\frac{1}{2}} = 2$	$\sqrt{4} = 2$
25	$25^{\frac{1}{2}} = 5$	$\sqrt{25} = 5$
576	$576^{\frac{1}{2}} = 24$	$\sqrt{576} = 24$
Answers may vary. (19 shown)	$19^{\frac{1}{2}} \approx 4.35889\ldots$	$\sqrt{19} \approx 4.35889\ldots$

Part B

x	$x^{\frac{1}{3}}$	$\sqrt[3]{x}$
1	$1^{\frac{1}{3}} = 1$	$\sqrt[3]{1} = 1$
8	$8^{\frac{1}{3}} = 2$	$\sqrt[3]{8} = 2$
27	$27^{\frac{1}{3}} = 3$	$\sqrt[3]{27} = 3$
343	$343^{\frac{1}{3}} = 7$	$\sqrt[3]{343} = 7$
Answers may vary. (2000 shown)	$2000^{\frac{1}{3}} \approx 12.59921\ldots$	$\sqrt[3]{2000} \approx 12.59921\ldots$

Lab Analysis

1. The numbers in the second column were identical to the corresponding numbers in the third column. This pattern applies to both tables.

2. A negative number cannot be square rooted since there is no real number (positive or negative) that can be squared to give a negative number. In order to obtain a negative product, there must be a positive factor and a negative factor. If this were the case, then the numbers would not be identical and therefore, the result would not be considered a square in the first place. In the case of cube roots, it is possible to cube root either a negative or a positive number, since the product of three negatives is negative and the product of three positives is positive.

3. Yes, the values in the second and third columns still match even if you select a number that is not a perfect square or a perfect cube.

4. The exponent $\frac{1}{4}$ means fourth root. The exponent $\frac{1}{5}$ means fifth root.

5. $47^{\frac{1}{5}} = \sqrt[5]{47}$