Comparing Exponents Guided Lesson Explanation

Explanation for 1) 6^4 _____ 4^6

Step 1) Calculate the final vale of both sides. The exponent tells how many times we multiply the base number by itself. $6^4 = 6 \times 6 \times 6 \times 6 = 1{,}296$ $4^6 = 4 \times 4 \times 4 \times 4 \times 4 \times 4 = 4{,}096$

Step 2) Compare the end values. 6^4 _____ 4^6

                                1,296   4,096

The left side is much **<u>less than</u>** the right side. $6^4 < 4^6$

Explanation for 2) 6^{-1} _____ 5^{-3}

In this case we are dealing with negative exponents. When we work with negative exponents, the negative exponents tells us how many times we need to divide by the number. An easy way to convert these are to put the positive value of the exponent over 1 . For instance:

$6^{-1} = \dfrac{1}{6} = 0.167$ $5^{-3} = \dfrac{1}{5^3} = \dfrac{1}{5 \, x \, 5 \, x \, 5} = \dfrac{1}{125} = 0.008$

Compare the values

  6^{-1} _____ 5^{-3}

0.167   0.008

The left side is much <u>greater than</u> the right side. $6^{-1} > 5^{-3}$

Explanation for 3) $99{,}999^0$ _____ 1^{999}

This problem is simple if you know 2 rules.

Rule 1: Any value to the zero (0) power is equal to 1. So $99{,}999^0 = 1$

Rule 2: One (1) to any power is equal to 1. So $1^{999} = 1$

Putting it all together: $99{,}999^0 = 1^{999}$