Exponents and Powers

Exponents or Powers:

If "a" is an integer, then

aXaXaXa....(n times)=a^n

a is called the base and n is called the exponent.

Powers of Rational Numbers:

a/b is a rational number and n is a positive integer,

$(a/b)^n = a^n/b^n$

Example: Solve $(2/3)^3$

$= 2^3/3^3$

= 8/27

Reciprocal of a Rational number:

If a/b is a rational number, then reciprocal of a/b is b/a

Example: Reciprocal of 9/8 is 8/9.

Laws of Exponents:

Law 1: If a is any non zero rational numbers and m and n are any two natural numbers

$a^m Xa^n = a^{m+n}$

Example: $6^2 X 6^5 = 6^{2+5}$

$= 6^7$

Law 2: If "a" is any non zero rational number and m and n are any two natural numbers

$a^m /a^n = a^{m-n}$

Example: $9^5/9^3$

Solution:

9^{5-3}

$= 9^2$

= 81

Law 3: If "a" is any non zero rational number and m and n are any two rational numbers

$(a^m)^n = a^{mXn}$

Example: $\{(7/5)^4\}^2$

Solution:$(7/5)^{4X2}$

$= (7/5)^8$

Law 4: If a and b are any two non zero rational numbers and n is any natural number,

$a^n \times b^n = (a \times b)^n$

Example: $(3/4)^5 \times (2/3)^5$

Solution: $(3/4 \times 2/3)^5$

$=(1/2)^5$