INDICES AND RECIPROCALS

We define the notation 2^2 is read as "two squared", "the square of two", or "two raised to the power of two." The notation means $2^2 = 2 \times 2$.

Other examples are: $2^3 = 2 \times 2 \times 2$ (i.e. 2 multiply itself 3 times)

$2^4 = 2 \times 2 \times 2 \times 2$

$2^5 = 2 \times 2 \times 2 \times 2 \times 2$

and so on…

This definition is true for any number whatsoever and for any index or power. Thus, $4^3 = 4 \times 4 \times 4$.

The number of places that we multiply the number by itself is called the power or the index; it is usually written as a superscript to the number. The number that is multiplies itself is called the base; it is usually written normally. For example, consider 7^4, 7 is the base while 4 is the index or power.

13^2, 7^4, 2^3, etc. are all index numbers. They are another notation for the numbers 169, 2401, 8, etc., since $13^2 = 13 \times 13 = 169$; $7^4 = 7 \times 7 \times 7 \times$

$7 = 2401; 2^3 = 2 \times 2 \times 2 = 8,$ etc. The plural of power and index are powers and indices respectively. Indices is the section in arithmetic that calculates operations among index numbers.

Reciprocals

If the product of any two numbers equal 1, then the two numbers are called reciprocals of each other.

Examples are 5 and ⅕; ⅛ and 8; etc.

Suppose a stands for any number, then a and $\frac{1}{a}$ are reciprocals since $a \times \frac{1}{a} = 1$. The index form of reciprocals of any number *a* is a^{-1}.

Dividing by a number will give same value as multiplying by its reciprocal. For example:

$$k \div m = k \times \frac{1}{m}$$

Also reciprocals of numbers are known as their multiplicative identity which is 1. An identity is that number which leaves another number unchanged after operation (addition and

multiplication). For example: $1 \times 4 = 4; 2 \times 1 = 2;$ 1 is multiplicative identity as it leaves the numbers 4 and 2 unchanged after multiplication operation.

Similarly, two numbers *a* and *–a* are additive inverses because their sum gives the additive identity, 0.