

USE OF EXPONENTS

Created: Tuesday, 13 September 2011 06:56 | Published: Tuesday, 13 September 2011 06:56 | Written by [Super User](#) | [Print](#)

The mass of earth, the distance of the Sun from the Earth, the number of stars in our galaxy, the speed of light, etc., are numbers which are very large. Such large numbers are normally approximate, not exact numbers. For the sake of convenience to read, write and remember such [large numbers](#) we write them as a certain number followed by a number of zeros. For example, the speed of light in vacuum is 299792.5 kilometres per second. It is approximated as 300000 kilometre per second or as 300, 000, 000 metre per second. To make it convenient, we write these numbers by using [exponents](#) with base 10. The speed of light in vacuum may be written as 3×10^8 metre per second.

Thus, every large number can be expressed as $k \times 10^n$, where k is some natural number. However, for the sake of uniformity, we write the numbers in the form $k \times 10^n$, where k is a [terminating decimal](#) number greater than or equal to 1 and less than 10 and n is a natural number.

Such a form of a number is known as its standard form.

Standard Form

A number is said to be in the standard form, if it is expressed as the product of a number between 1 and 10 (including 1 but excluding 10) and a positive integer power of 10.

The standard form of a number is also known as [Scientific Notation](#).

By using the following steps, we can write large numbers in the standard form or Scientific Notation:

Step I: Obtain the number and move the decimal point to the left till you get just one digit to the left of the decimal point.

Step II: Write the given number as the product of the number so obtained and 10^n , where n is the number of places the decimal point has been moved to the left. If the given number is between 1 and 10, then write it as the product of the number itself and 10^0 .

Example 1:

Express the following number in standard form:

3, 90, 878

$$390878 = 390878.00$$

The decimal point is moved through five places to obtain a number in which there is just one digit to the left of the decimal point.

$$\text{Therefore, } 390878.00 = 3.90878 \times 10^5$$

Example 2:

Write the following number in the usual form:

$$7.54 \times 10^6$$

$$7.54 \times 10^6 = 7,540,000$$

Now try it yourself! Should you still need any help, [click here](#) to schedule live online session with e Tutor!

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Reference Links:

- http://en.wikipedia.org/wiki/Scientific_notation
- http://en.wikipedia.org/wiki/Repeating_decimal
- http://en.wikipedia.org/wiki/Large_numbers
- <http://en.wikipedia.org/wiki/Exponentiation>

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