# Very Big and Very Small Numbers

As the number is less than one the power of ten is negative.

This part is made up of a number from 1 up to (but not including) 10.

This part is written as a power of 10, and the power is a whole number.

Mathematicians, scientists and engineers (and your calculator) prefer to write and work with very large and very small numbers in standard form.

A number is in standard form when it is written like this:

6.7 x 106

You could think of 1000 as being 1 x 10 x 10 x 10 and write it as 1 x 103 .

You could think of 10 000 as being 1 x 10 x 10 x 10 x 10 and write it as 1 x 104.

Complete the table below, the first three rows have been completed for you.

200 could be written as 2 x 102.

300 could be written as 3 x 102.

250 could be written as 2.5 x 102.

Complete the table on the left, the first three rows have been completed for you.

|  |  |
| --- | --- |
| **Number** | **Number in standard form** |
| 200 |  |
| 230 |  |
| 300 |  |
| 399 |  |
| 400 |  |
| 415 |  |
| 500 |  |
| 550 |  |
| 9870 |  |

The power of ten is the place value of the first significant figure.

|  |  |
| --- | --- |
| **Number** | **Number in standard form** |
| 1 000 000 | 1 x 106 |
| 100 000 | 1 x 105 |
| 10 000 | 1 x 104 |
| 1 000 |  |
| 100 |  |
| 10 |  |
| 1 |  |
| 0.1 |  |
| 0.01 |  |
| 0.001 |  |

|  |  |  |
| --- | --- | --- |
| **Numbers to add** | **Calculation** | **Answer in standard form** |
| 5 x 102 + 5 x 103 |  |  |
| 5 x 102 + 5 x 104 |  |  |
| 5 x 102 + 5 x 105 |  |  |
| 5 x 103 + 5 x 104 |  |  |
| 5 x 103 + 5 x 105 |  |  |
| 5 x 103 + 5 x 106 |  |  |
| 4 x 102 + 3.1 x 103 |  |  |
| 4.1 x 102 + 3.1 x 103 |  |  |
| 5 x 10-2 + 5 x 10-3 |  |  |
| 5 x 102 + 5 x 10-2 |  |  |

To add numbers written in standard form you must write them to the same power of ten.

e.g.

3 x 104 + 4 x 105 = 3 x 104 + 40 x 104 = 43 x 104 =4.3 x 105

# Adding Very Big and Very Small Numbers