

Standard Form

Standard form is a number between 1 and 10 multiplied by a power of 10

It is an easier way to write really big or really small numbers

Instead of writing
3540000000000000000000000000
we can write 3.54×10^{23}

Instead of writing
0.000000000000000025
we can write 2.5×10^{-16}

Multiplying Standard Form

Example 1. $(3 \times 10^5) \times (2 \times 10^6)$

This means:

$$3 \times 10 \times 10 \times 10 \times 10 \times 10 \times 2 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10$$

We can multiply the front numbers, and the tens separately:

$$6 \times 10^{11}$$

Example 2. $(3 \times 10^5) \times (4 \times 10^6)$

$$12 \times 10^{11}$$

This is not in standard form, so we have to change our answer:

$$1.2 \times 10 \times 10^{11}$$

$$1.2 \times 10^{12}$$

Dividing Standard Form

Example 1. $(8 \times 10^8) \div (2 \times 10^6)$

We can divide the front numbers, and the tens separately:

$$(4 \times 10^2)$$

Example 2. $(7 \times 10^5) \div (2 \times 10^{-2})$

$$(3.5 \times 10^7) \longleftarrow 5 - (-2) = 7$$

Adding/Subtracting Standard Form

Example 1. $(3 \times 10^5) + (2 \times 10^6)$

300000

2000000

To add standard form we have to make the powers the same.
We cannot add hundred thousands to millions.

$$(0.3 \times 10 \times 10^5) + (2 \times 10^6)$$

$$(0.3 \times 10^6) + (2 \times 10^6)$$

$$(2.3 \times 10^6)$$

Example 2. $(3 \times 10^8) - (2 \times 10^7)$

$$(3 \times 10^8) - (0.2 \times 10 \times 10^7)$$

$$(3 \times 10^8) - (0.2 \times 10^8)$$

$$(2.8 \times 10^8)$$