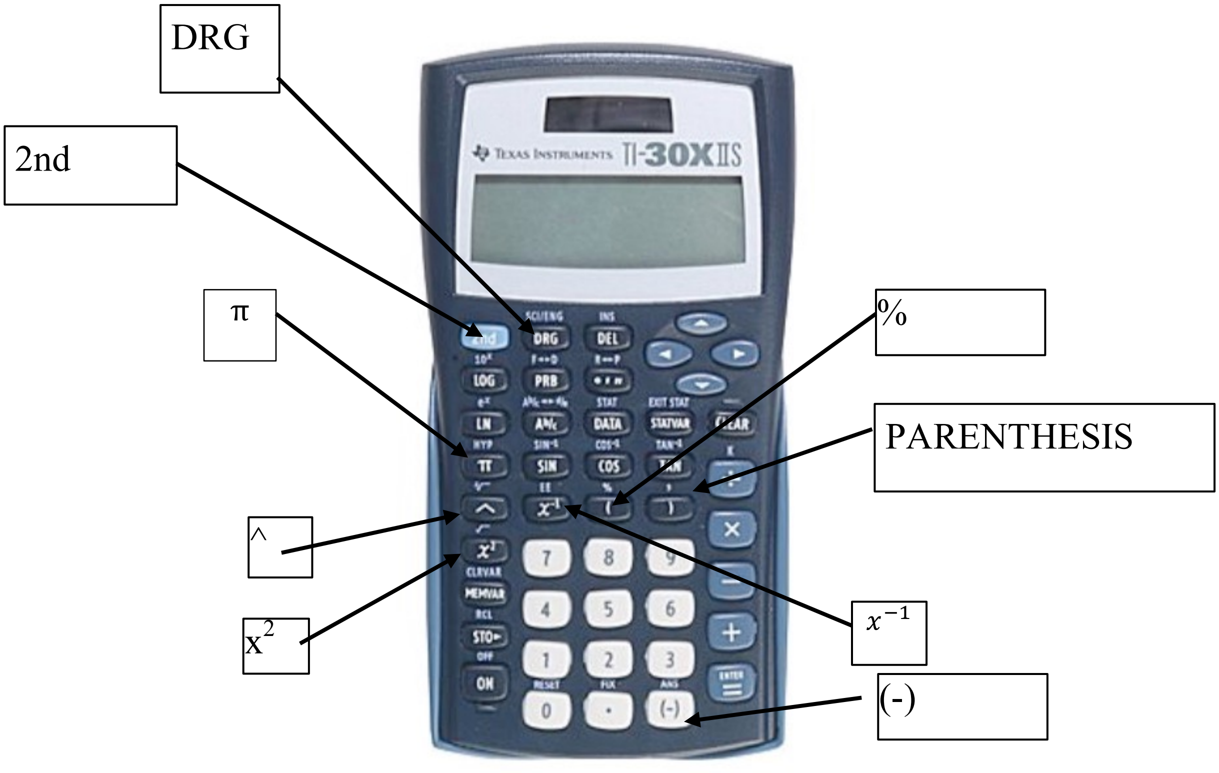
The TI-30X IIS Calculator and Scientific notation



These are the buttons we will be using to calculate in scientific notation.

Make sure that your calculator is set to display numbers in scientific notation by clicking $\boxed{\text{2nd}}$ $\boxed{\text{DRG}}$ and using arrow keys to underline SCI. Hit enter and you are good to go.

We will be using the $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ button to input the numbers in scientific notation.

- Inputting values in scientific notation: input the number, press $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$, input the power, press =.

Input 3.24×10^6: 3.24 $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ 6 =

You screen should look like this: $3.24{\times}10^{06}$

Input 4.65×10^{-4}: 4.65 $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ $\boxed{\text{(-)}}$ 4 =

You screen should look like this: $4.65{\times}10^{-06}$

Scientific notation is used when dealing with very large and very small numbers in applications.

The volume of a sphere is given by the formula: $\frac{4}{3}\pi r^3$

1. Given the radius of the Earth is 6.30×10^{6} meters, find its volume.

➢ Type 4 ÷3. Now press $\boxed{\pi}$

You screen should look like this: 4/3 π

➢ Now input (6.30 $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ 6) $\boxed{\wedge}$ 3. A $\boxed{\wedge}$ key allows you to raise a number to any power. In this example we are raising radius to cube power.

You screen should look like this: 4/3 π (6.30E6)^3 1.05 $\times10^{21}$

2. Given that the radius of the Sun is 6.96×10^{8} meters, find the volume of the sun.

➢ Input: 4 ÷ 3 $\boxed{\pi}$ $\boxed{(}$6.96 $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ 8$\boxed{)}$ $\boxed{\wedge}$ 3 =

You screen should look like this: 4/3π **(6.96E8)^3** 1.41 $\times10^{27}$

3. How many Earths will fit into the Sun? This requires the volume of the sun to be divided by the volume of the earth.

➢ Input: 1.41 $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ 27 ÷ 1.05$\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ 21 =

You screen should look like this: 1.41E27/1.05E21 1.34 $\times10^{06}$

When working with very small amounts like the mass of a water molecule which is 3.00×10^{-26}, negative numbers are used in the exponent. Make sure that you use negative sign key (-) rather than minus key.

4. The total mass of the earth is 5.98×10^{24} kilograms and about 0.023% of the earth is water. If the mass of one water molecule is 3.00×10^{-26} kilograms, how many water molecules are there on the earth?

➢ First find the amount of water on the earth and then divide by the size of one water molecule.

Input: 5.98 $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ 24 × 0.023 $\boxed{\text{2nd}}$ $\boxed{(}$ ÷ 3.00 $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ $\boxed{(-)}$ 26 =

You screen should look like this: 5.98E24*0.033%/3.00E10-26 4.58 $\times10^{46}$

The gravitational pull between two bodies of mass M1 and M2 at the distance D is given by the formula $F = G\,\frac{M1 \times M2}{D^2}$ where G is the universal gravitational constant, G= $6.67\times10^{-11}\ \frac{Nm^2}{kg^2}$

5. Calculate the force between the Sun and the Earth, if mass of the Sun is $M_{sun} = 2 \times 10^{30}$ kg and mass of the Earth is $M_{earth} = 5.97 \times 10^{24}$ kg and the distance between them is $D = 1.496 \times 10^{8}$ m. Inputting these numbers formula becomes:

$$F = 6.67\times10^{-11}\ \frac{2\times10^{30}\ \times5.97\times10^{24}}{(1.496\times10^{8})^2}$$

- Input 6.67 $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ $\boxed{\text{(-)}}$ 11 × 2 $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ 30 × 5.97 $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ 24 ÷(1.496 $\boxed{\text{2nd}}$ $\boxed{x^{-1}}$ 8) $\boxed{x^2}$ =

You screen should look like this: 6.67E-11 * 2E30 * 5.97E24 ÷(1.496E8)^2= 3.56 ×$\mathbf{10^{28}}$