

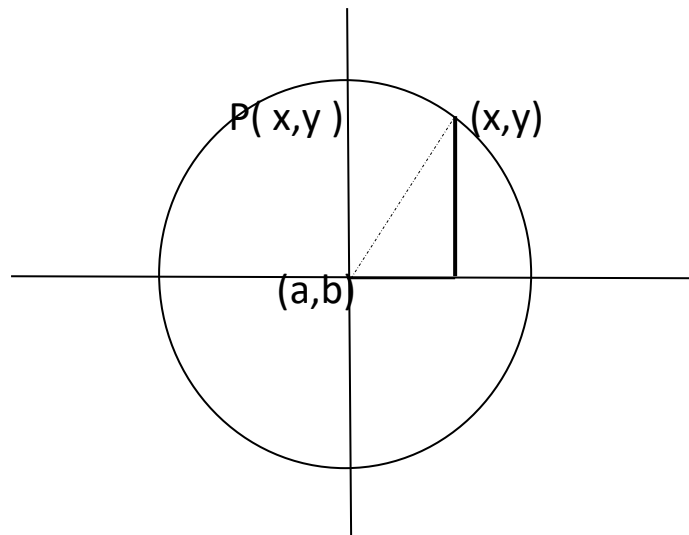
TREATISE ON SPHERES:

We know that the equation of the ellipse is:

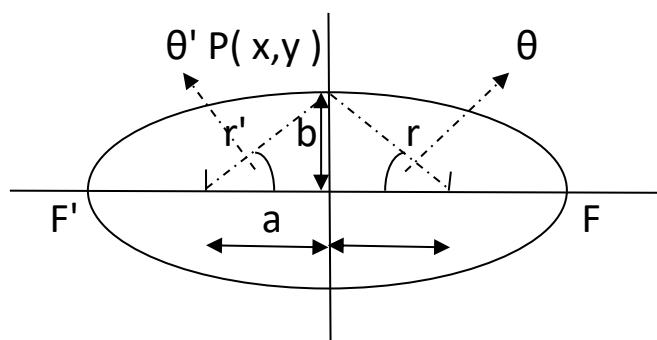
$$(x^2/a^2) + (y^2/b^2) = 1$$

Coming from: $2a = d(F',P) + d(F,P)$

Starting from the sphere: $r^2 = (x-a)^2 + (y-b)^2$:



But back to the ellipsis:



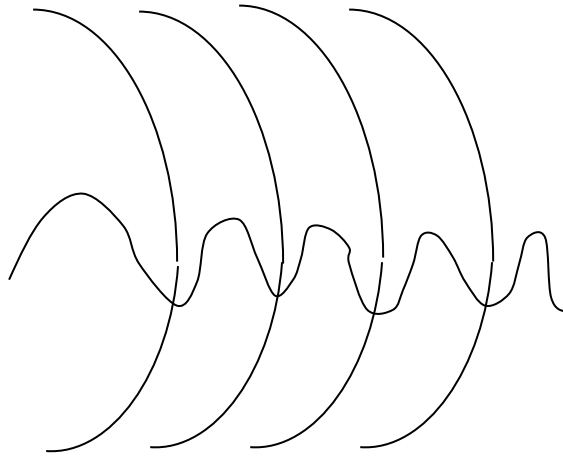
And assuming the problem in which the orbit of a body revolves ellipsoidally towards the planet (or the sun, for example), which has as its “x” axis $x = a \cdot \cos \theta'$ and as its “y” axis $y = b \cdot \sin \theta'$

Everything fits, since by substituting the previous expressions into $(x^2/a^2) + (y^2/b^2) = 1$ everything fits.

$x^2 + y^2 = r^2$ or the same with r' . Also $\theta = \omega t$ where t is the time

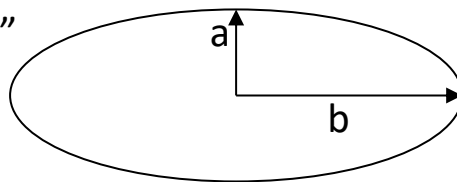
In 3-D each layer of the “onion” that is the Universe has a certain speed: $v = \omega R$

Moreover, longitudinal and transverse waves can be treated equally:



I take this opportunity to insert the expression for the area of the ellipse: $\pi \cdot a \cdot b$

Where “a” and “b”



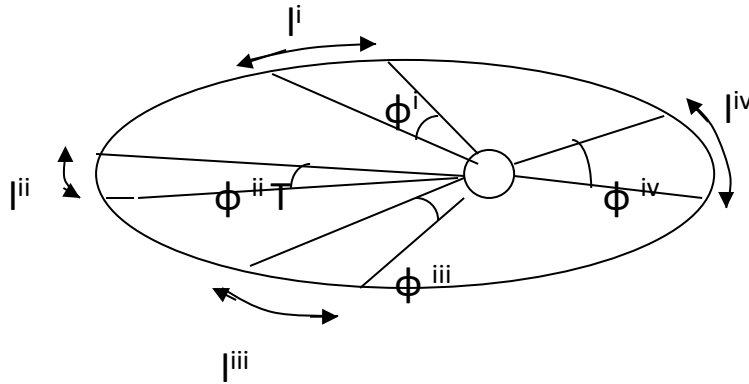
but the surface area of a melon (ellipsoid in three dimensions) is:

$$S \approx 4\pi \cdot (a^p b^p + a^p c^p + b^p c^p / 3)^{1/p}$$

While the perimeter $\approx 2\pi \cdot \sqrt{a^2 + b^2 / 2}$

Now, keeping on the study :

Through the following figure I see that



The different slices of the pie are the fragments of the curve traveled in the same "lapse" of time, and the area of each one is constant (otherwise the orbit would end up collapsing or losing its shape: logical).

Knowing that the "l" are each equal to the Radius multiplied by the corresponding angle : $d\phi$

In constant time periods the area is constant even though R and ϕ vary .

And that the area, operating with differential or infinitesimal spaces , is the vector product of:

$S = \dot{Area} = [\|\vec{R}\| \times \|\vec{dl}\|]/2$ or $Area = [\|\vec{R}\|. 2.Sin\phi]/2$, we know that $\vec{R}$ and $\vec{dl}$ are perpendicular.

If we replace $\vec{dl}$ by $R \times d\phi$ and this in turn by $d\phi = w.dt$,

$$\|\dot{Area}\| = \|\vec{R}\|. |R|. |w|. \|dt\|/2$$

$$v = \omega \times R$$

Furthermore, the angular momentum $\vec{L}$ is the same at all points in the orbit, since if it were not, it would also end up collapsing or losing its shape.

$\vec{L} = m \cdot \vec{v} \cdot \vec{r}$ and $L^2 = 2 \cdot i E$ where $i = m r^2$ and E is the energy that we can deduce from the orbiting body.

When r increases, the speed decreases

Let's assume that $\|\vec{R}\| = |R|$

$$\frac{\|\dot{Area}\|}{\|dt\|} = |R| \cdot v / 2 = |R| \cdot \frac{|L|}{2 \cdot m \cdot |R|} = \frac{\sqrt{2 \cdot I \cdot E}}{2m}$$

