Origin of the function ψ (x,t):

We have 2 terms, namely: E= h ν = ħω = p ^{2} /2m

p= ħk

how is that ψ (x,t)= $e^{\pm ikx \pm i\omega t}$? Because ψ (x,t)= Θ(x).ϕ (t)

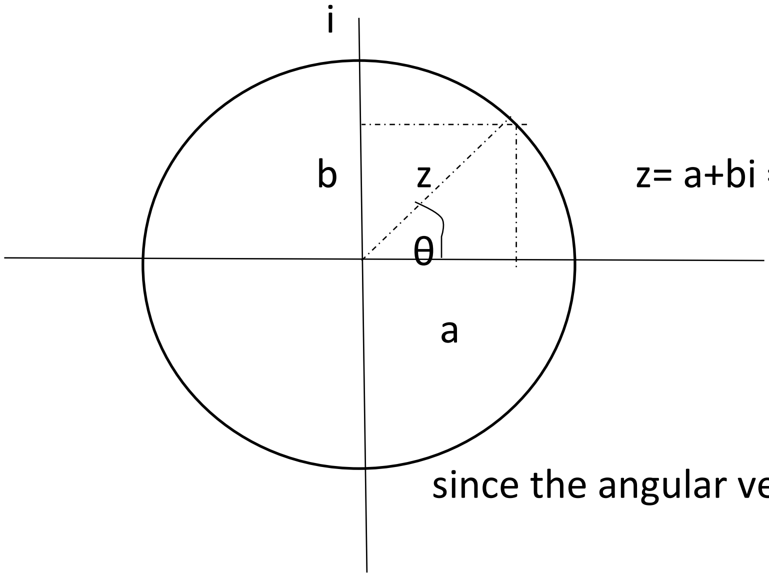
$i\hbar\,\frac{\partial \psi(x,t)}{\partial t} = \frac{-\hbar^2}{2m} \cdot \frac{\partial^2 \psi(x,t)}{\partial x^2}$

E_t = Ec + Ep

and $i\hbar(i\omega)\psi = -\frac{\hbar^2}{2m}.(ik)^2\psi \rightarrow -i\omega\,\psi = +(\hbar/2m).k^2\psi$

$\rightarrow = E_t/\hbar\,\psi$ aleshores $\psi(x) = \Theta(x) = e^{ikx}$

representating the oscillator harmonic in a circle :



z= a+bi = re$^{i\theta}$ = re$^{i\omega t}$

since the angular velocity =ω=θ/t

the movement of the body is designated by $e^{\pm iE_t/\hbar}$while we know that the position is $e^{\pm ikx}$

the position is f(x) and the speed is f(t).and now, knowing none where is the direction of ψ (x,t), we have ψ (x,t)=$r.e^{ikx-i\omega t}$

or ψ (x,t)= $r.e^{-ikx-i\omega t}$(or ψ (x,t)= r. $e^{-ikx+i\omega t}$?)

or ψ (x,t)= $r.e^{+ikx+i\omega t}$?

where r ≡amplitude