

Completteness

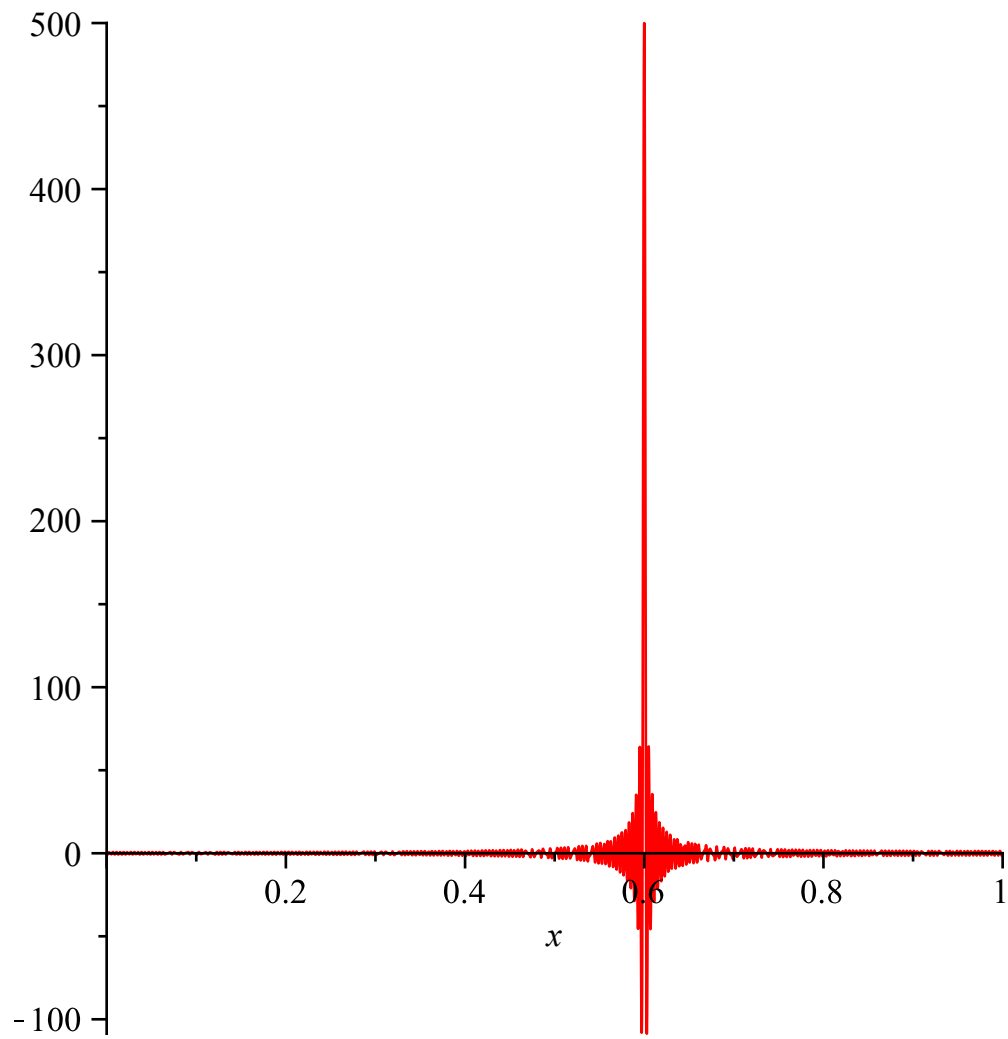
```
> restart:
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```
u := (x,n) -> 2^(1/2)*sin(n*Pi*x);  
Nf := 500:
```

```
d := x -> sum(u(x,n)*u(0.6,n),n=1..Nf):
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```
plot(d(x),x=0..1);
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$$u := (x, n) \rightarrow \sqrt{2} \sin(n \pi x)$$



Time evolution

```
> restart;

c := n-> 96^(1/2)/Pi^2/n^2*sin(1/2*n*Pi):
u :=(x,n) -> (2/a)^(1/2)*sin(n*Pi*x/a):

psi0 := x-> sum( c(n)*u(x,n),n=1..nf ):

Rpsi := (x,t) -> sum( c(n)*u(x,n) * cos( n^2*hbar*
Pi^2/2/m/a^2 *t)      ,n=1..nf):
Ipsi := (x,t) -> sum( -c(n)*u(x,n) * sin( n^2*hbar*
Pi^2/2/m/a^2 *t)      ,n=1..nf):

P2 := (x,t) -> Rpsi(x,t)^2 + Ipsi(x,t)^2:

a:=1:      nf := 100:
hbar:=1: m:=1:      ti:=0: tf:=2:

with(plots):
p1:=plot(psi0(x),x=0..1,title="condicion inicial"):
p2 := plot(psi0(x)^2,x=0..1,title="probabilidad inicial"):
p3:= animate(plot,[P2(x,t),x=0..1,title="probabilidad en t",
numpoints=1000],t=ti..tf,frames=50):
A := Array([p1,p2,p3]):
display(A);
```

