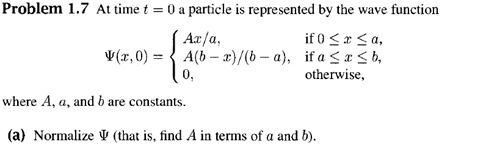
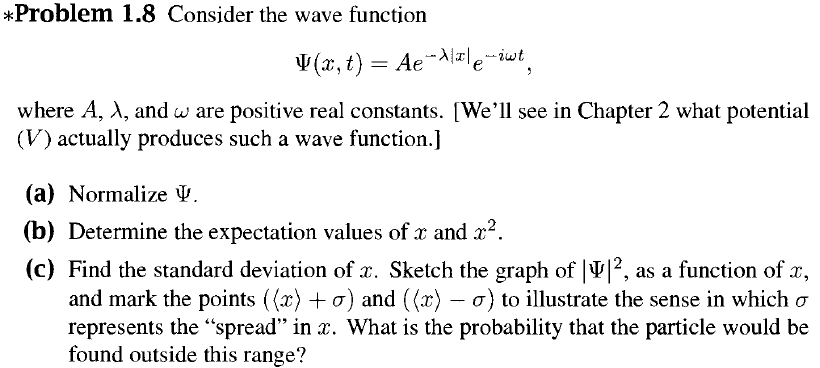
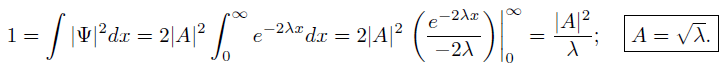
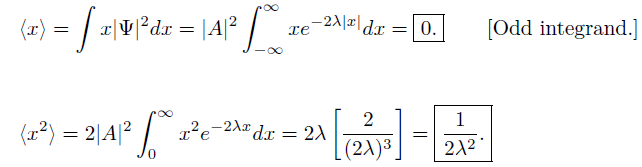
Quantum Mechanics Notes

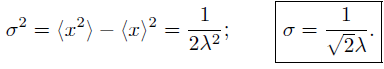
Schrodinger equation

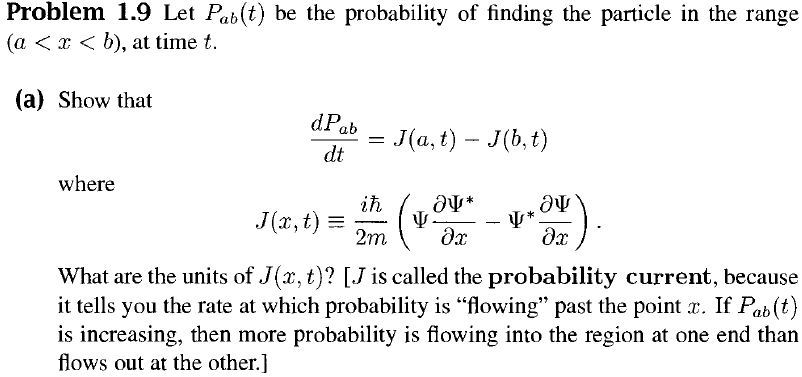


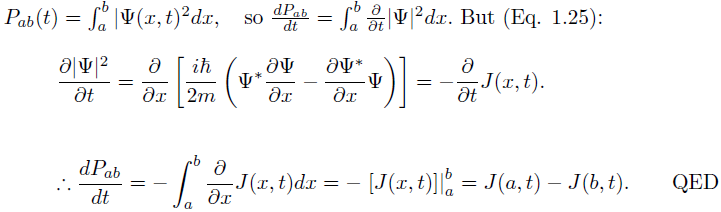


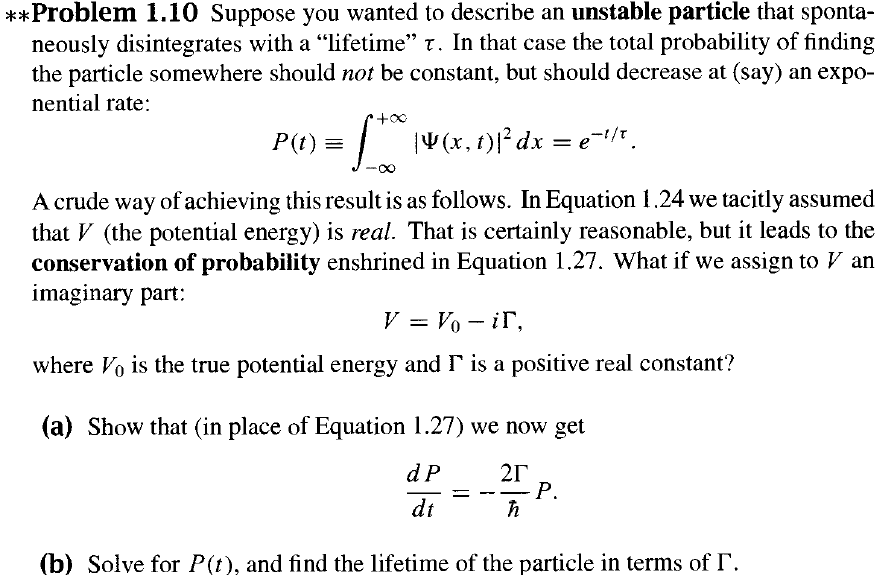


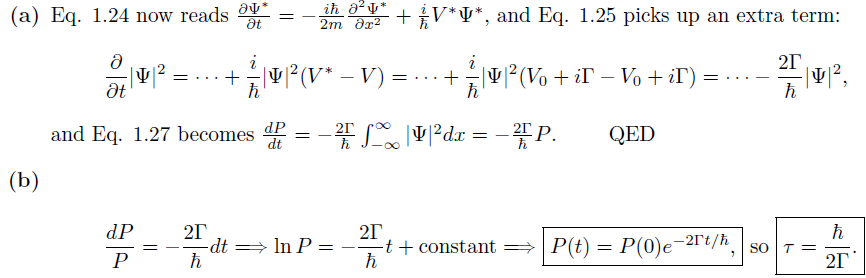


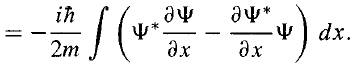
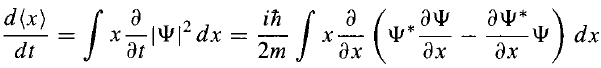


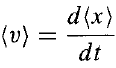


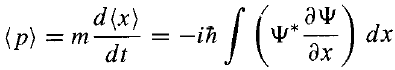
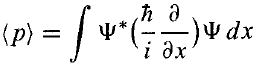




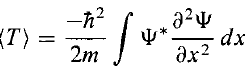


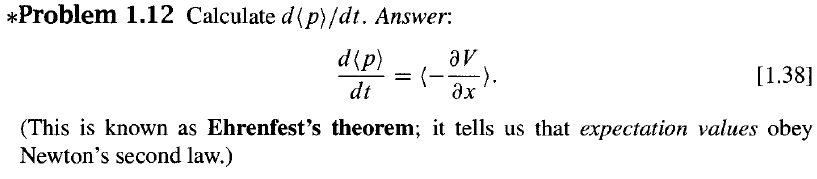


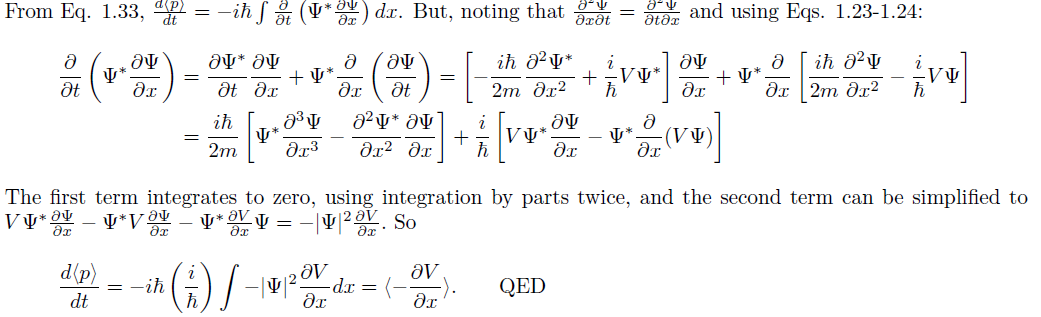
 

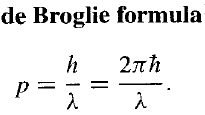
 

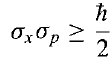


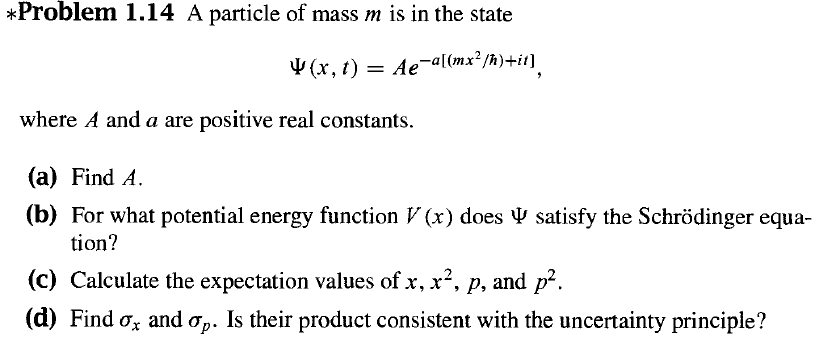


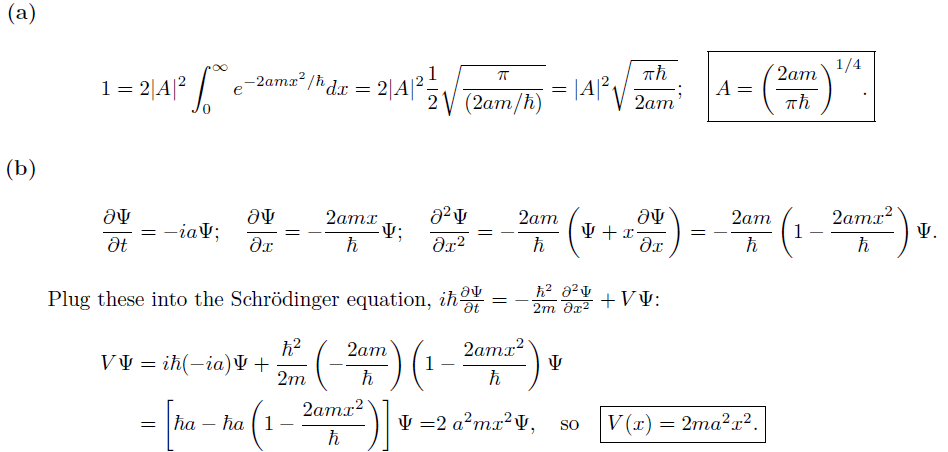


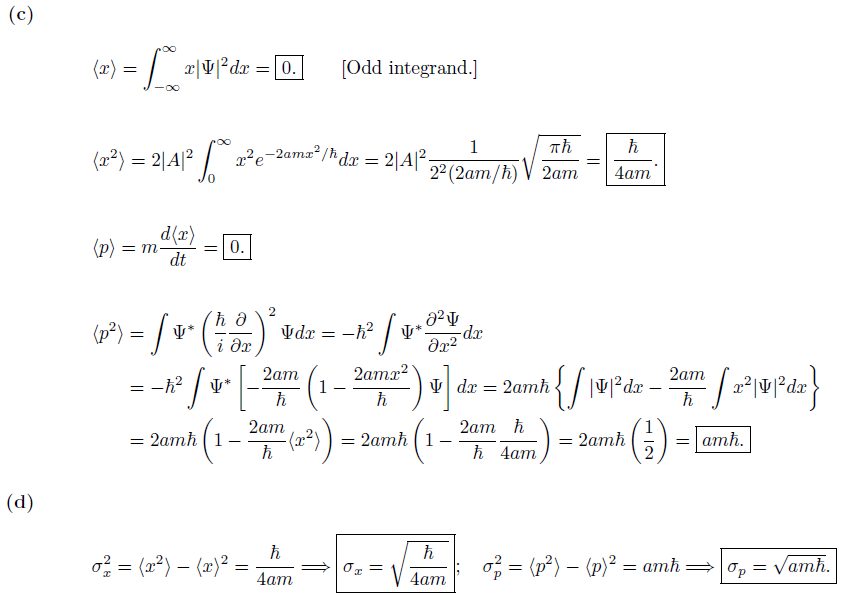




Uncertainty principle 



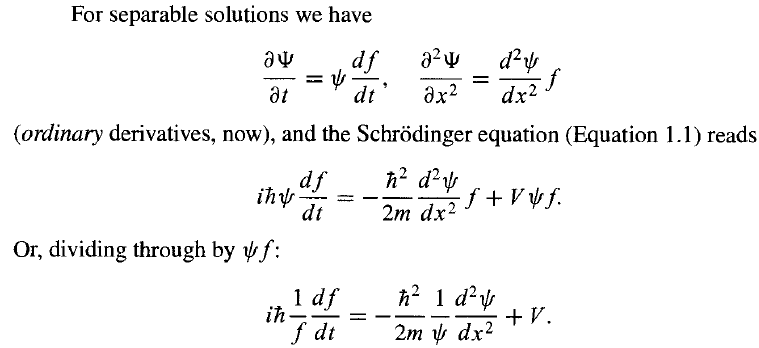


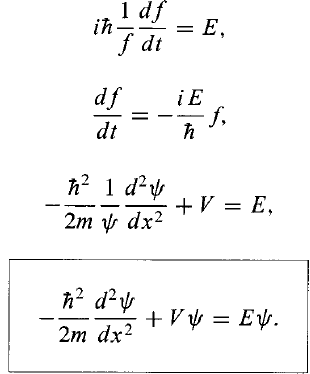


TISE

Separation of variables

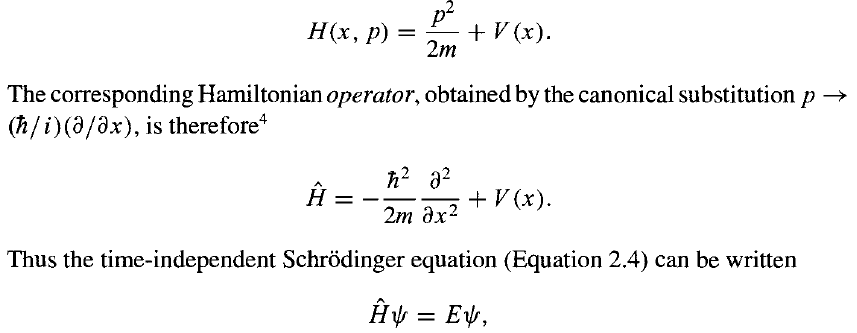


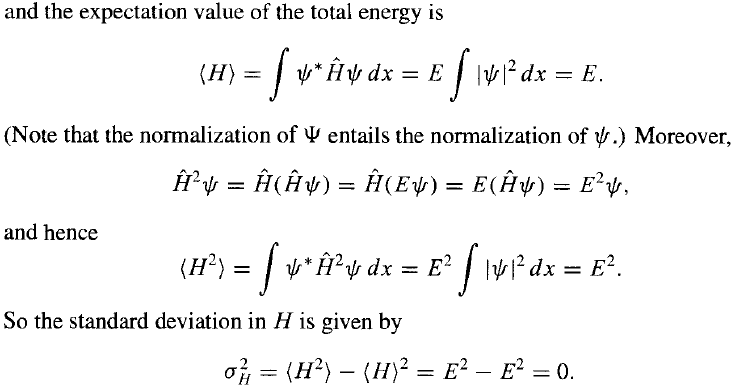


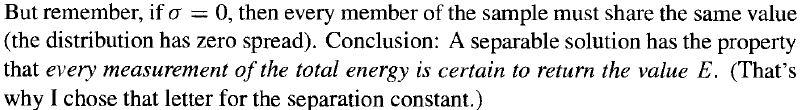


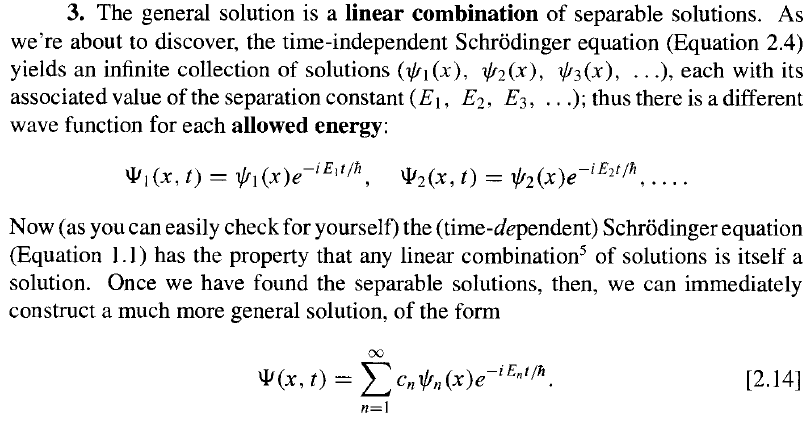


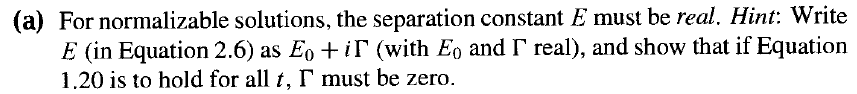


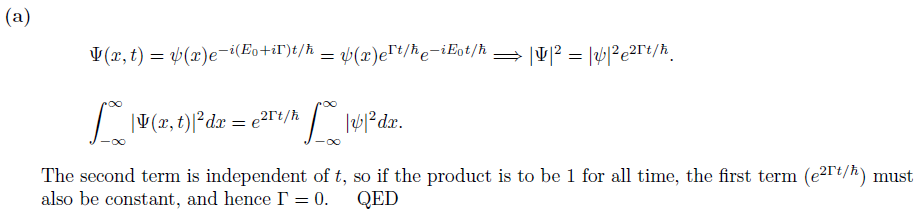


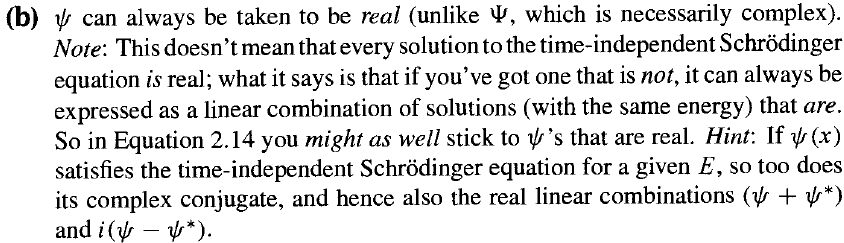


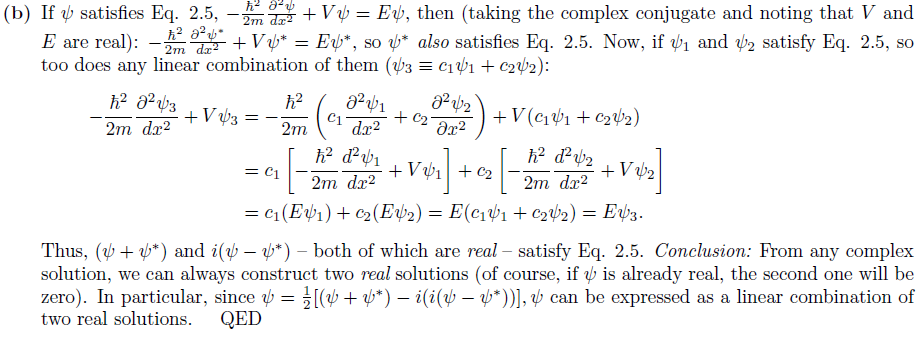


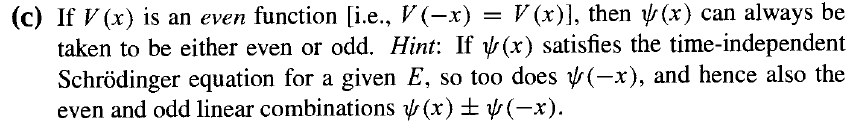


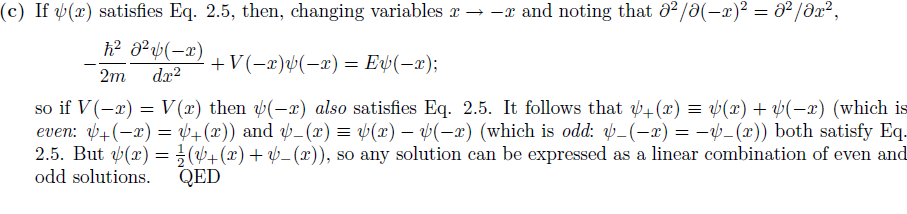


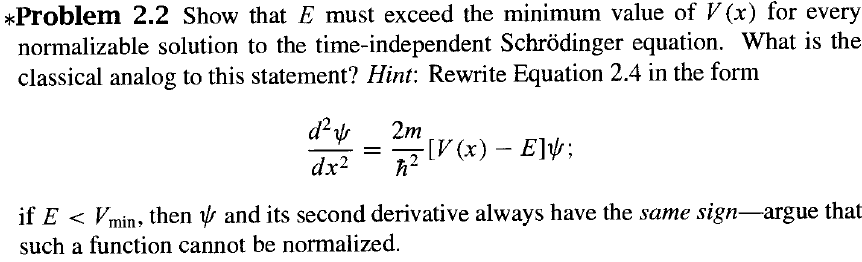


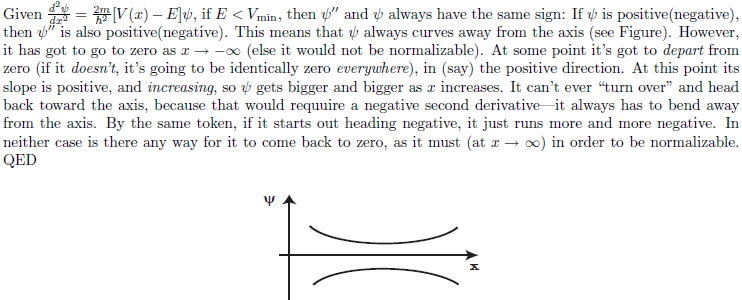


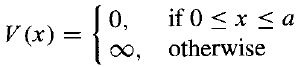
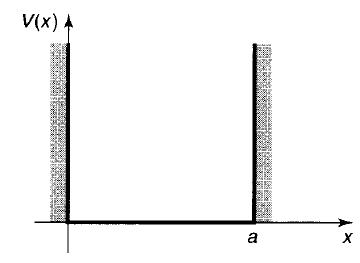


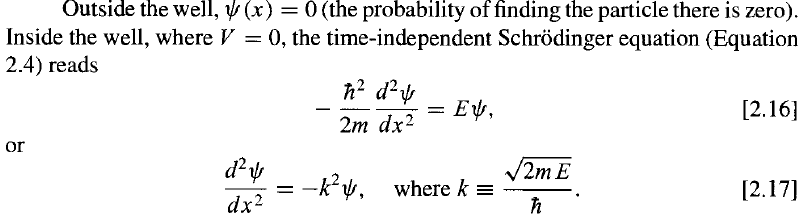






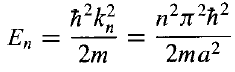


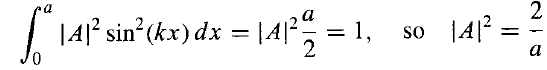
Infinite square well  

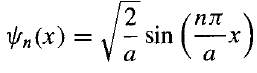


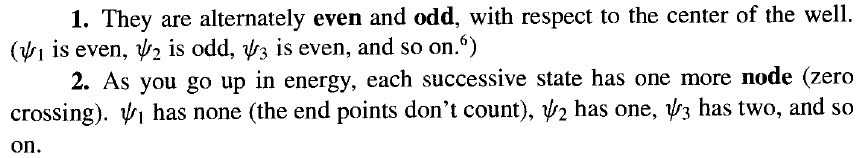
 

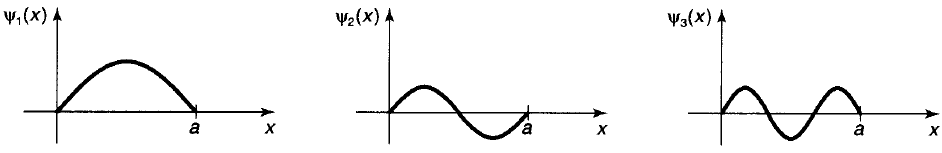
   

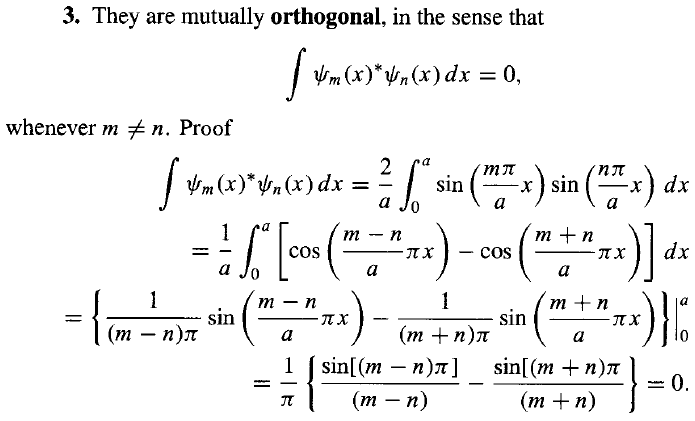


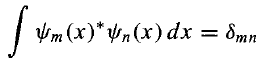


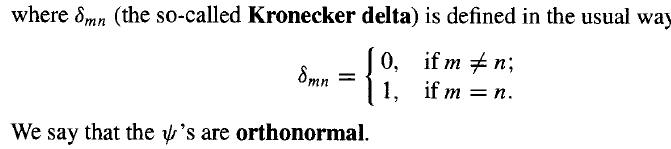


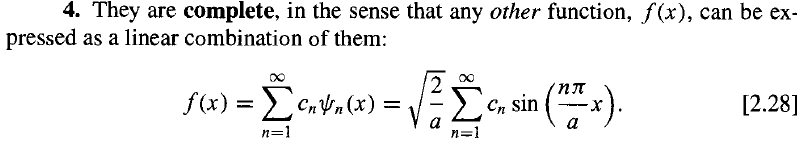




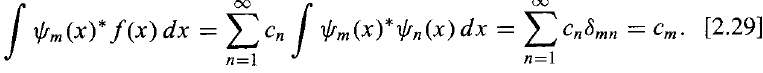




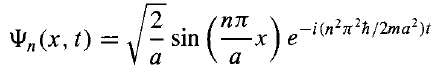


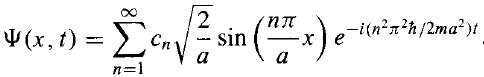


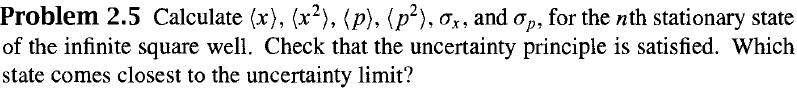
Fourier’s trick

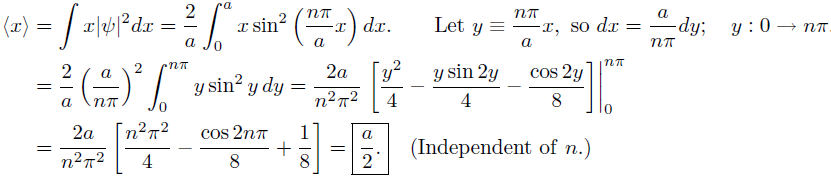


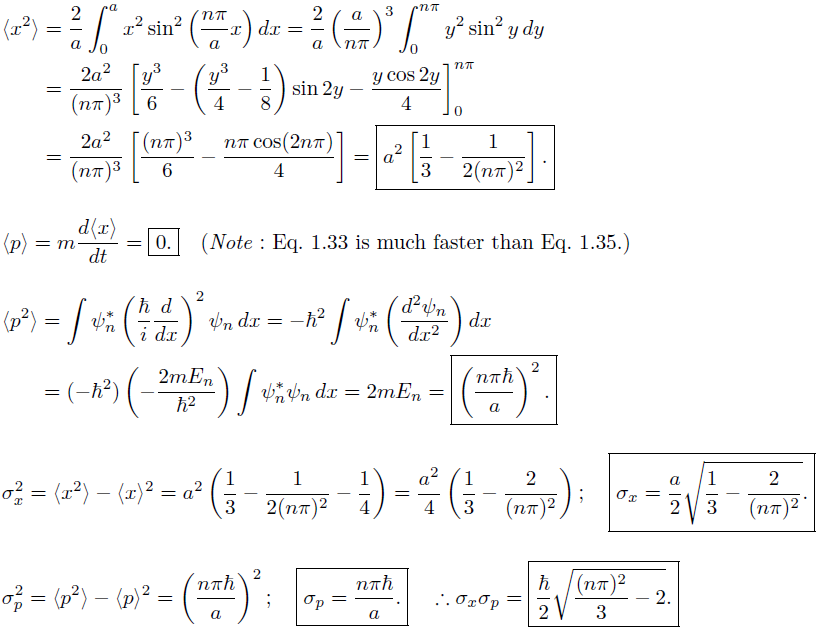


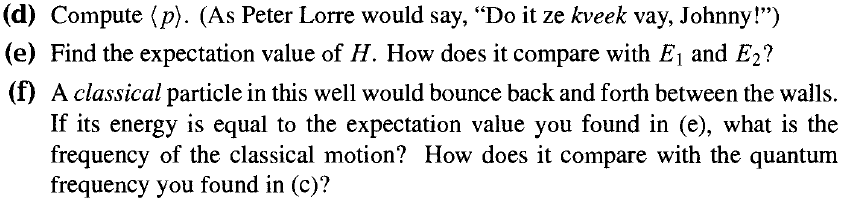
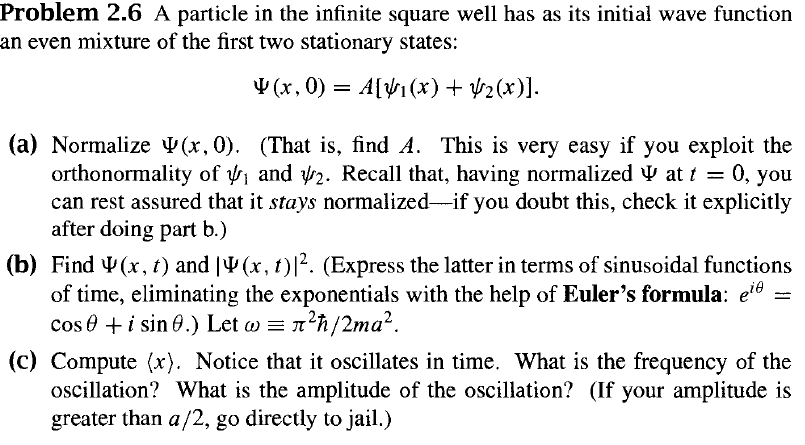
Stationary states of the infinite square well 

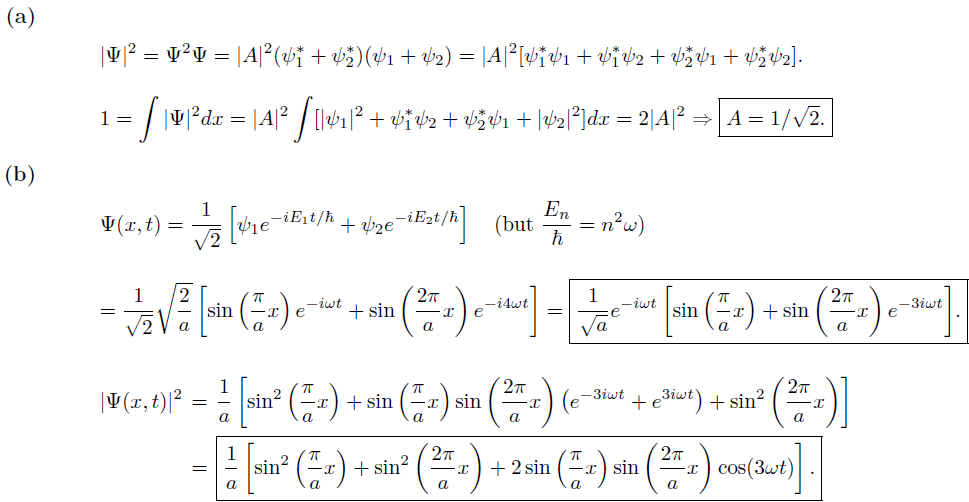


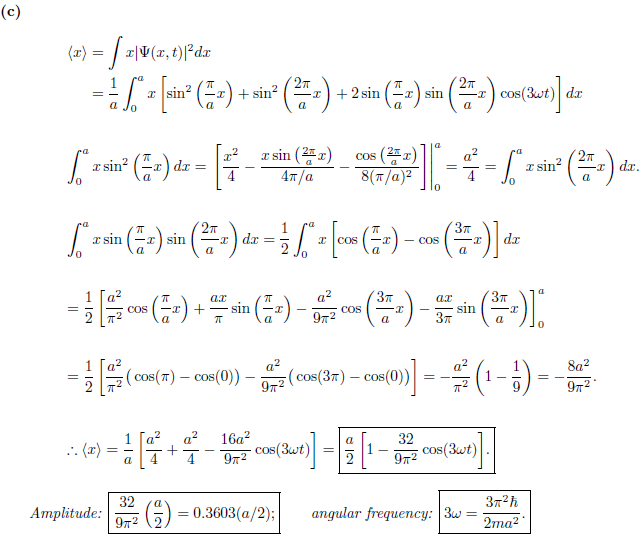


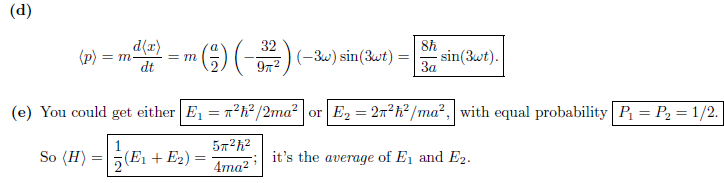


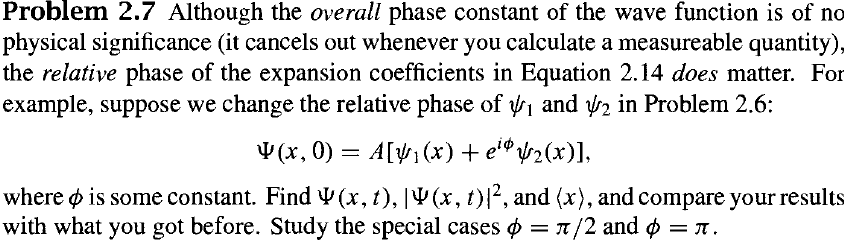


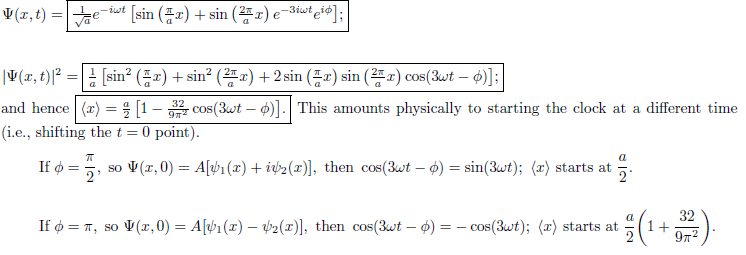


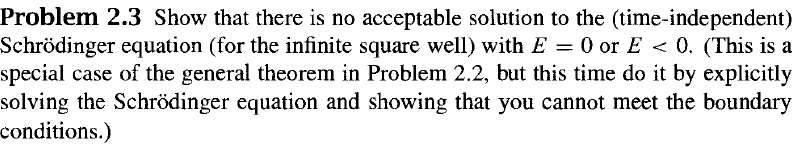


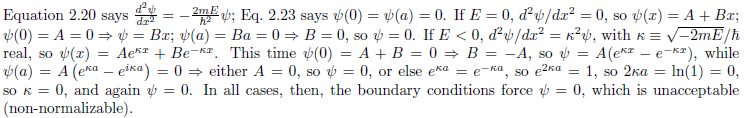






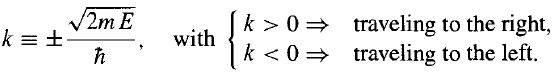


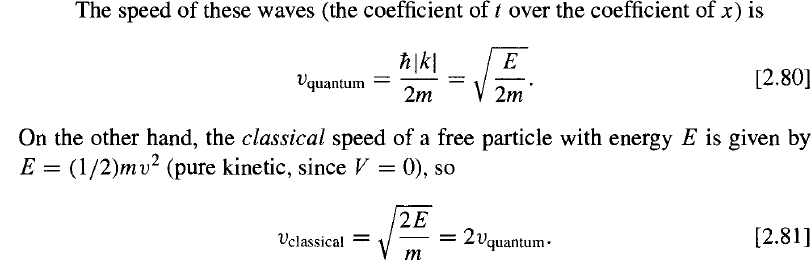


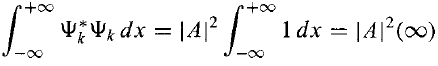


Free particle

V(x) = 0

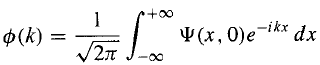




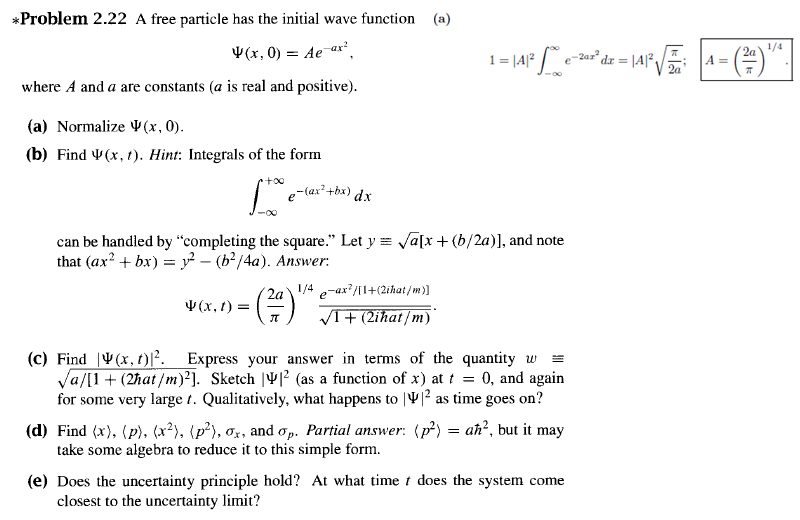
 This wave function is not normalizable.

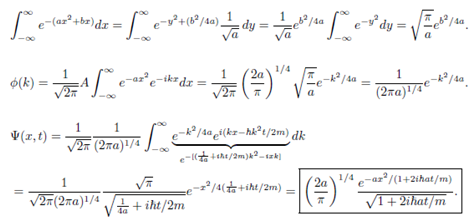
The separable solutions do not represent physically realizable states. A free particle cannot exist in a stationary state. There is no such a thing as a free particle with a definite energy.

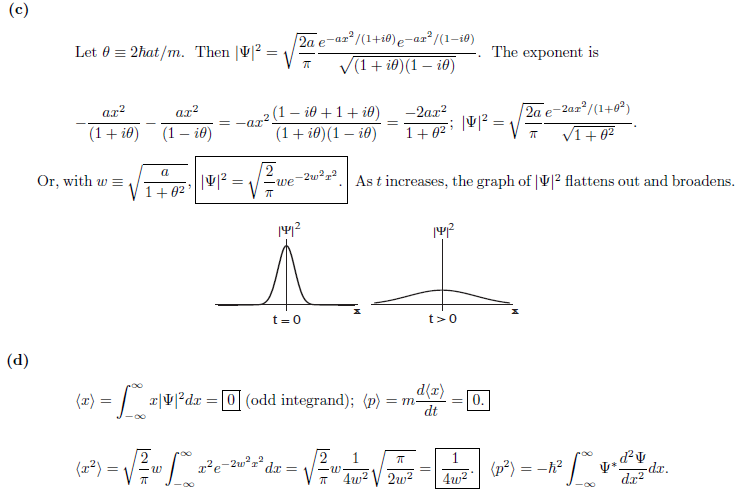


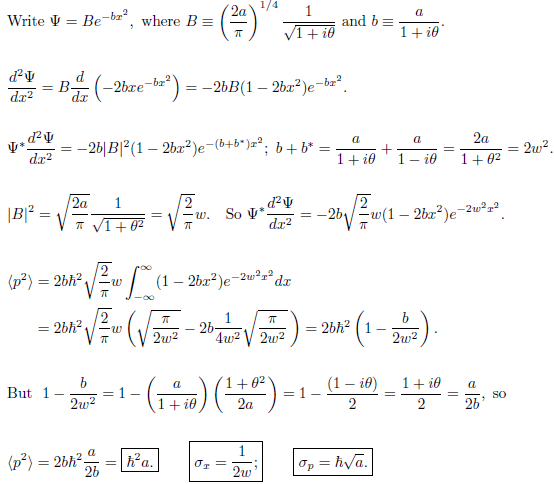
 

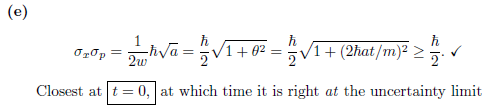


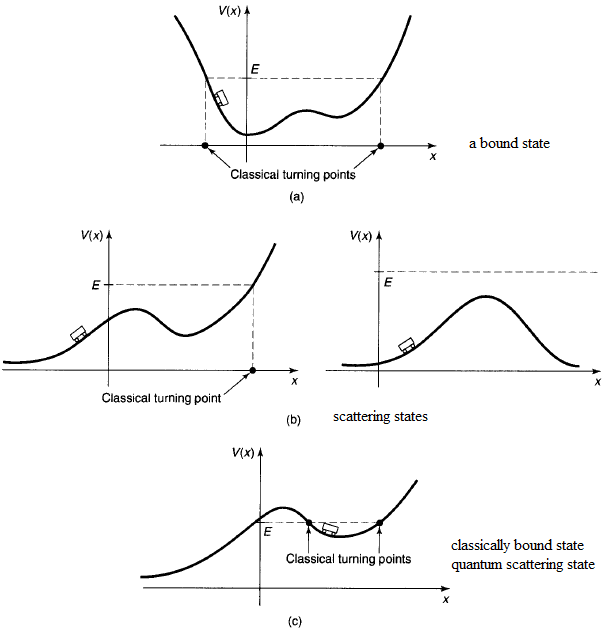






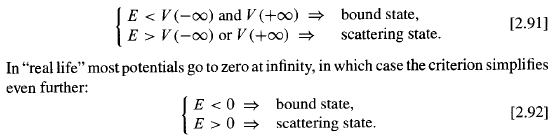


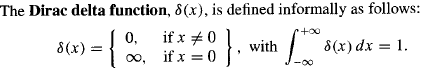


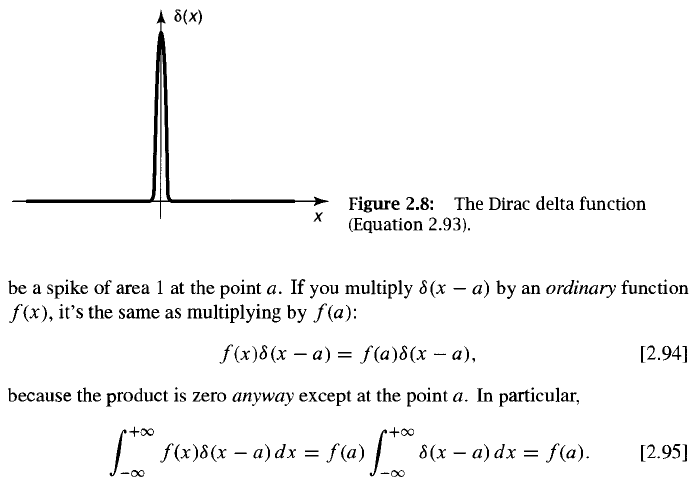


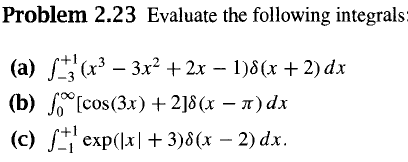
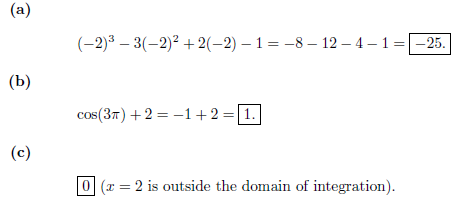
If V(x) rises higher than the particle’s total energy € on either side, then the particle is stuck in the potential well. It rocks back and forth between the turning points, but it cannot escape. This is a bound state.

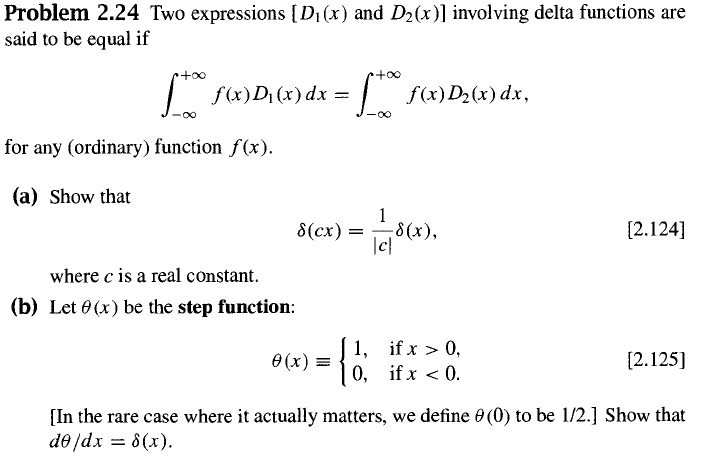
If E exceeds V(x) on one or both sides, then the particle comes in from “infinity”, flows down or speeds up under the influence of the potential and returns to infinity. We call this a scattering state.

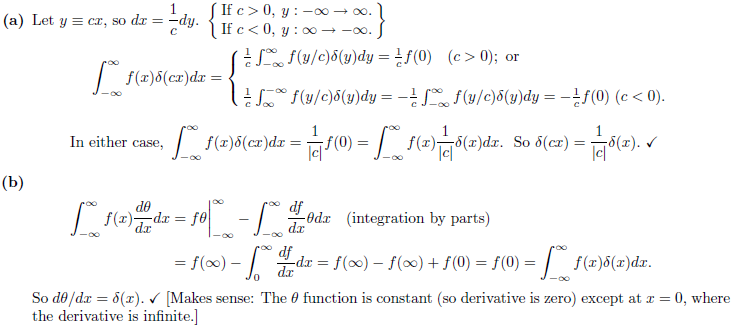


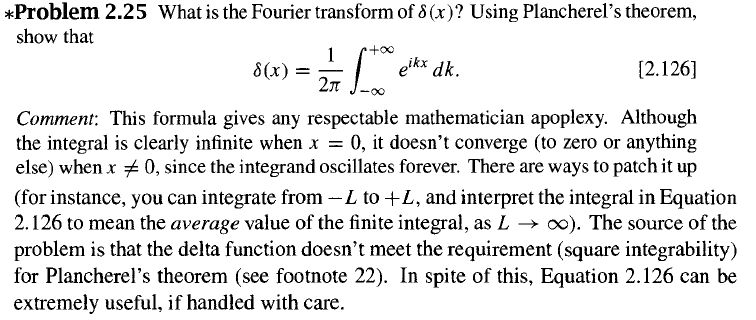


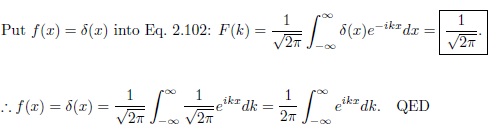


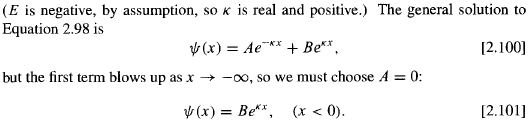




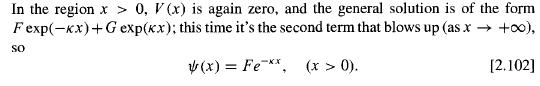


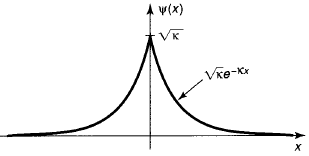
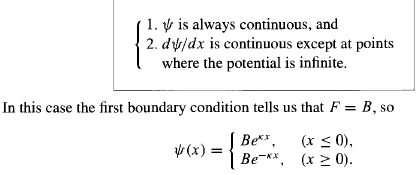


**If E<0, in the region x<0, V(x) = 0**

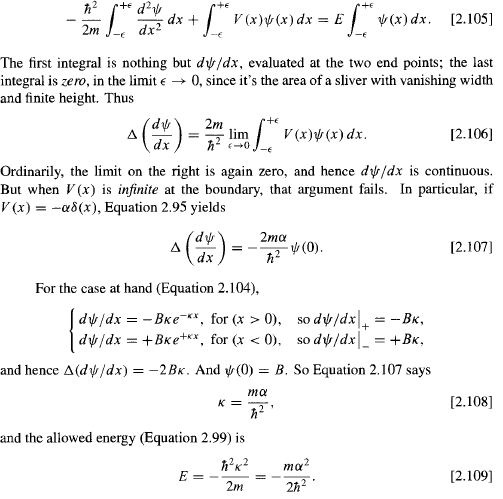


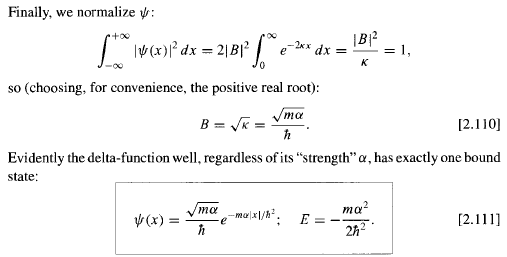
**If E < 0 , in the region x>0, V(x)=0**



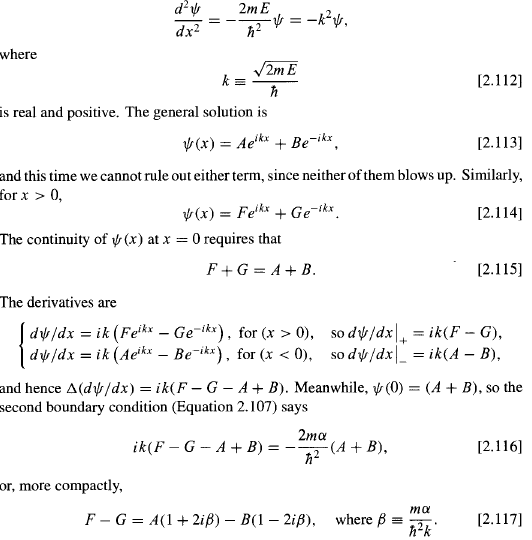


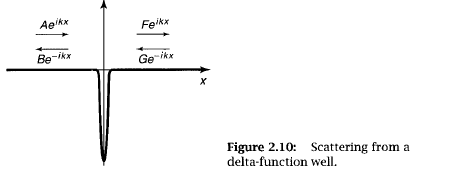
The idea is to integrate the Schrodinger equation from - to , and then to take the limit as

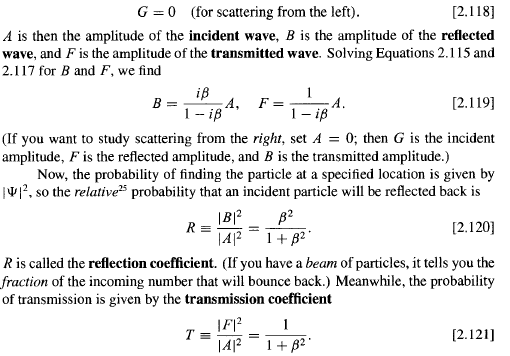




If E>0, x<0



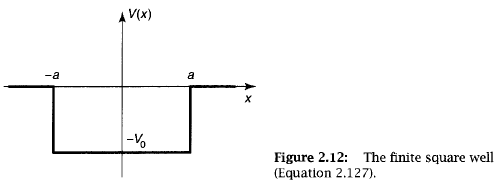




R + T = 1



Finite square well



In x –a, V(x) = 0

