Quantum Mechanics
Physics 237

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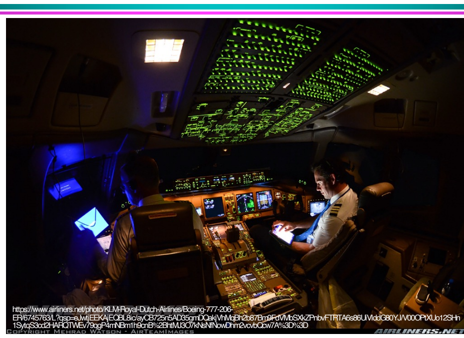
1

Course Information

- Homework # 4 is due on Friday 2/18.
- If you feel that you deserve more points on Exam # 1, you need to return your exam to me with a note describing why you feel you deserve more points. You have until 2/24 to make such a request. Your TAs cannot change your exam grade.
- Check Question 4c. Our initial solution was not correct. The correct solution is: orbit A has $n_\theta = 3$, orbit B has $n_\theta = 2$, and orbit C has $n_\theta = 1$.
- The next midterm exam on March 22 covers Chapters 5 – 8.

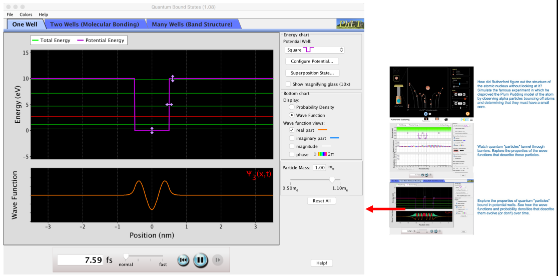
2

Getting ready for the approach into Tehran. KLM 777-206/ER.



3

Explore properties of wavefunctions.



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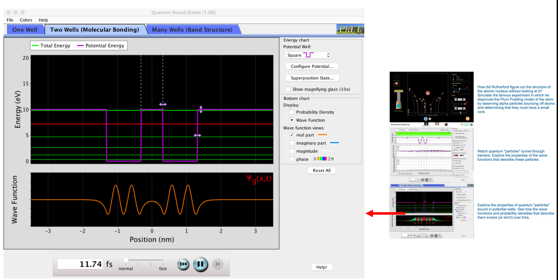
4

Explore properties of wavefunctions.



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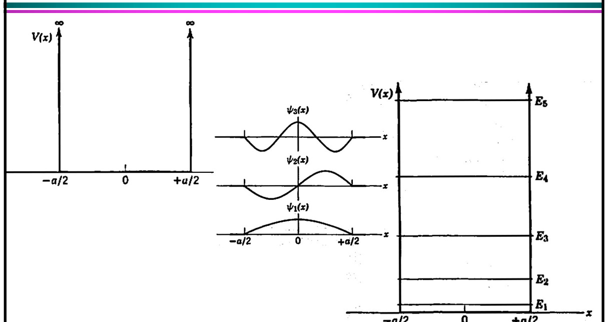
5

The infinite well.



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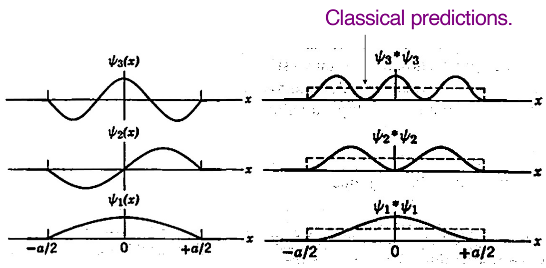
6

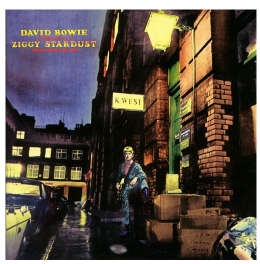
Solutions in the infinite well.



7

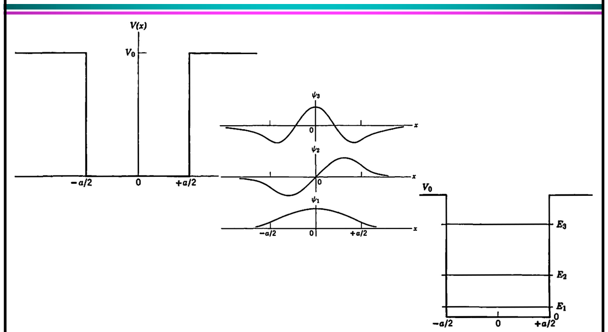
4 Minute 42 Second Intermission.

- Since paying attention for 1 hour and 15 minutes is hard when the topic is physics, let's take a 4 minute 42 second intermission.
- You can:
  - Stretch out.
  - Talk to your neighbors.
  - Ask me a quick question.
  - Enjoy the fantastic music.



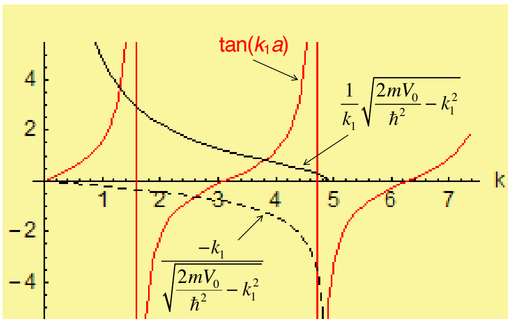
8

Finite well.



9

Finding eigen values.
$V_0 = 12, a = 2.$



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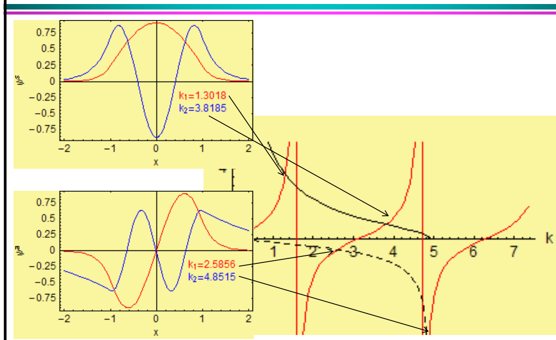
10

Finding eigen values.
$V_0 = 12, a = 2.$



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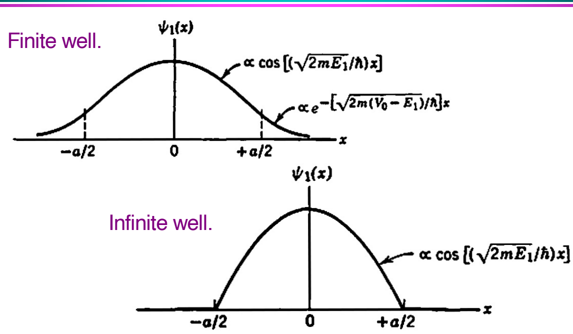
11

Differences between finite and infinite wells.



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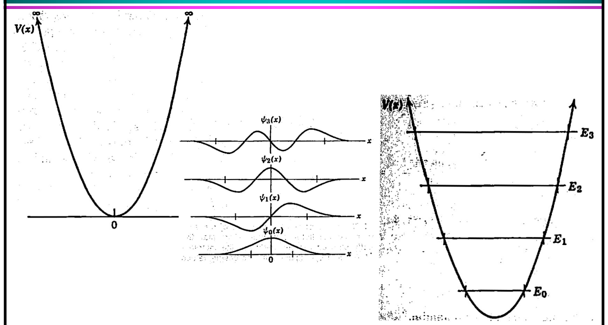
12

Simple harmonic oscillator.



Summary of systems studied in chapter 6.

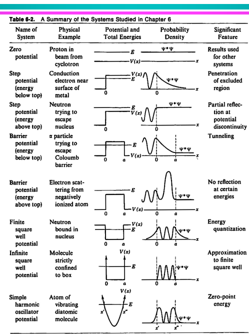


Table 6-2. A Summary of the Systems Studied in Chapter 6

Name of System	Physical Example	Potential and Total Energies	Probability Density	Significant Feature
Zero potential	Proton in beam from cyclotron			Results used for other systems
Step potential (energy below top)	Conduction electron near surface of metal			Penetration of excluded region
Step potential (energy above top)	Neutron trying to escape nucleus			Partial reflection at potential discontinuity
Barrier potential (energy below top)	α particle trying to escape Coloumb barrier			Tunneling
Barrier potential (energy above top)	Electron scattering from negatively ionized atom			No reflection at certain energies
Finite square well potential	Neutron bound in nucleus			Energy quantization
Infinite square well potential	Molecule strictly confined to box			Approximation to finite square well
Simple harmonic oscillator potential	Atom of vibrating diatomic molecule			Zero-point energy

ENOUGH FOR TODAY?