Homework #5

Computational Physics: Fall 2023 Professor Coan & Olness

Due Wednesday 20 September 11:59pm in Canvas upload

0) PROGRAM SUBMISSION:

For problems where you submit code please use the following format so I can EASILY run your code.

- 1. Make a new sub-directory with your name and homework #
- 2. Copy the source code ONLY (not the big executable) into this directory
- 3. Make a 'doit' file that will compile the code; be sure to use debugging flag '-g'
- 4. Move up to the upper level directory (where 'olness2' directory is located)
- 5. Zip this into a zip file: zip olness2.zip ./olness2/*
- 6. Upload the zip file to canvas.

1) [20 points] Using Python Jupyter notebook, reproduce the below plots as best you can.



2) [20 Points] We are going to investigate the Kepler potential.

As a function of r, plot:

a) the Kepler potential V=-k/r,

b) the (pseudo) centrifugal force $L^2/(m r^3)$ and POTENTIAL $L^2/(2 m r^2)$

c) the sum.

Choose suitable values for the constants, so that the plot shows a minimum at finite values of r such that that there is a region of bound orbits.