

2a

All plots are shown in the code. The Euler Integration method is used to get arrays for velocity and position respectively. All plots are done with respect to time, except for one which shows the plot for the x-displacement vs the y-displacement. This particular plot shows the trajectory of the planet around the sun. Run the included code to access all the plots.

2b

A reasonable value for the time step is 60 seconds here. This time step is optimized for Earth and Mars and the change in total energy is plotted across 2 years since this encompasses BOTH the revolution time for Earth and Mars. (Mars takes 1.88 Earth years to complete revolution around the sun) As expected, the behavior is sinusoidal.