Homework 1

Due Friday 11/15 in class

Consider a tunnel dug through the center of the spherical earth along a diameter.

1)   Show that a particle (rock, train, whatever) falling into this tunnel will undergo simple harmonic motion.

2)   Find the period of the motion.

3)   Compare this period to the period of the space shuttle orbiting the earth (the shuttle is not very high above the surface).

4)   Show that the harmonic motion (1) and the period (2) do not require that the tunnel go through the earth's center, as long as it is straight.