

Geophysics Problems: Due 12/4

1. Here's a 2,000 year old classic – do it on your own to get the full thrill. A vertical meter stick in Missoula casts a 1.100-meter shadow at noon. Another meter stick exactly 250 km north casts a 1.191-meter shadow at exactly the same time. Carry three decimal places of accuracy and determine the radius of Earth.
2. Suppose P_cP , for $\delta = 0$, on a planet with radius 6,000 km takes 12.5 minutes; the planet has a constant P-wave velocity in the mantle of 8 km/s. The planet has a mass of $6 \cdot 10^{24}$ kg and a moment of inertia (I) of $0.3300 MR^2$. Assuming that the mantle and core have constant but different densities (P_c & P_m), calculate P_c and P_m .

This is an algebra problem, with two equations in two unknowns:

- mass of planet = mass of mantle + mass of core
- moment of planet = moment of core + moment of mantle.