Homework 3. The Earth Interior and Seismo-Tectonics  
(due next Thursday) 

Name: ____________

1) Basic Earth Numbers. Using consistent units (m, kg, s, etc.), write down key Earth parameters:
   - Average Earth radius
   - Average depth to the core
   - Average density of the Earth
   - Average thickness of continental crust
   - Average thickness of oceanic crust
   - Mass of the Earth

2) Using the numbers above, compute the volume of
   - the Earth core
   - the Earth crust (assume a thickness that is an average of the thicknesses of continental and oceanic crust)
   - the Earth mantle

3) What is Moho?

4) List main seismic boundaries in the mantle (a sketch may be useful). What do they represent?
5) Add the following terms to the diagram above (add drawings if necessary):
   (a) angle of reflection
   (b) angle of refraction
   (c) critical angle
   (d) direct wave
   (e) head wave
   (f) Snell’s law
6) Compute the moment magnitude ($M_w$) of a hypothetical strike-slip earthquake that completely circles the Earth along the equator. Assume the average rupture depth of 15 km, and slip of 5 m. To calculate the seismic moment, you will need the shear modulus. You can estimate one using the shear wave velocity (3.5 km/s) and density (2800 kg/m³). Pay attention to units.