GEOS 602 – Geophysical Fields
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Problem Set #1 Due Tuesday February 2

1. Is each of the following statements about the gravitational potential and gravitational field true or false? Use a logical, mathematical or graphical argument to support your answer (that means "TRUE" or "FALSE" are not sufficient answers).

    a. On an equipotential surface (surface on which the potential is constant), the magnitude of the gravitational field is constant, although the direction may change.

    b. The gravitational field vector is always oriented in a direction orthogonal to an equipotential surface.

    c. For a body of uniform density but arbitrary shape, the shape of the equipotential surface will be the same as the shape of the body.

    d. If a planet is made entirely of fluid, and is not subject to surface currents or tides, the shape of the planet will be the same as the shape of its equipotential surface, regardless of the details of its density distribution.

2. Work problem 5-1 in Turcotte and Schubert.

3. Work problem 5-2 in Turcotte and Schubert.

4. Work problem 5-3 in Turcotte and Schubert.