MTH 434/534 **HW #6** Winter 2011

1. **SPHERICAL COORDINATES, III**

Consider the sphere of radius r, in spherical coordinates (θ,ϕ), with line element

$$ds^2 = r^2 \left(d\theta^2 + \sin^2 \theta \, d\phi^2 \right)$$

(a) Find the connection 1-forms ω_{ij} in this basis.

(b) Compute $\Omega_{ij} = d\omega_{ij} + \omega_{ik} \wedge \omega_{kj}$ for $i, j = 1, 2$ (and where there is an implicit sum over k).

(c) (Optional) Compare your answers (and your computations) with those from the previous homework assignment.