48 [2 points]
Please define the scalar curvature S of a Riem. mfd (X, g). Please express S in terms of the covariant components R_{ijhk} with respect to a chart φ. ☐

49 [1+3 points]
a) What does it mean that an entity is isometrically invariant?
and probably (I'll check that)
b) Please show that the scalar curvature is isometrically invariant.

50 [1 point]
Please give an example of a 2 dimensional Riemannian domain with constant negative Gaussian curvature.
☐

51
already done in 34. ☐

52 [2 points]
Please define the Ricci curvature tensor on a Riem. mfd (X, g). Please express Ric in terms of the covariant components R_{ijhk} with respect to a chart φ. ☐

53 [4 points]
Let (D, g) be a Riem. domain. Let $a \in D$ be a point in which all first and second order derivatives of g vanish, i.e. $a \in \bigcap_{h,i,j} Z\left(\frac{\partial g_{ij}}{\partial x^h}\right) \cap \bigcap_{h,k,i,j} Z\left(\frac{\partial^2 g_{ij}}{\partial x^k \partial x^h}\right)$.
Please calculate either the scalar curvature or the Riemannian curvature tensor. ☐

Don't forget 37!