

1. Compute the Riemann curvature of the Schwarzschild geometry.

*You may use any formalism you wish, and any coordinate system you wish. However, the results discussed in class will emphasize computations using differential forms in an orthonormal Schwarzschild (“shell”) basis. You **may** use computer algebra to compute the connection 1-forms (or the Christoffel symbols), but a printout must be attached. Make sure you understand the conventions being used! You **may not** use computer algebra to compute the curvature 2-forms, although you are welcome to check your answers that way. Your answer should consist of all independent nonzero curvature 2-forms (or components of the Riemann tensor).*

2. Compute the Ricci curvature of the Schwarzschild geometry.

It is enough to take the appropriate trace of the Riemann tensor (components of the curvature 2-forms), that is to compute the components R_{ij} of the Ricci tensor, which are given by

$$R_{ij} = R^m{}_{imj}$$

What answer do you expect?