

# Riemannian Geometry

## Hints 6

1. Denote  $X = \sum_{i=1}^n a_i(p) \frac{\partial}{\partial x_i}$ ,  $Y = \sum_{i=1}^n b_i(p) \frac{\partial}{\partial x_i}$  and compute everything using the formula

$$\nabla_v X = \sum_{i=1}^n v(a_i) \frac{\partial}{\partial x_i} \Big|_p$$

2. (\*) Use the formula

$$\Gamma_{ij}^k = \frac{1}{2} \sum_{k,l} g^{kl} (g_{il,j} + g_{jl,i} - g_{ij,l})$$

and the fact that  $g_{ij}$  is diagonal.