Riemannian Geometry

Hints 15-16

1. (*) To prove that $Ric_p(v) > 0$ compute similarly to the computations in Problems class.

2. The proof is similar to the proof of the second variation formula of the length.

3. (*) One can either do it by direct computation or to use the result of Example 4.5 (explaining Levi-Civita connection on a surface through the orthogonal projection.

4. (a) Problem 4 (HW 13-14) implies in particular that

$$R(v_1, v_2)v_3 = K(\langle v_2, v_3 \rangle v_1 - \langle v_1, v_3 \rangle v_2).$$