

## Riemannian Geometry, Hints 6

- 6.1** (b) Use that a tangent vector to  $S^2$  at  $(x, y, z)$  is orthogonal to the normal vector  $(x, y, z)$ .
- 6.2** (b) It is possible to generalize the solution of Exercise 4.4.(b).
- 6.3** (a) Write  $l(t)$  as an integral, compute it, and find  $l^{-1}(t)$ .
- (b) First, find  $Im(c(t))$  by removing imaginary part from the denominator; then find  $c'(t)$  (using initial formula for  $c(t)$ ); finally compute  $\|c'(t)\|$  and  $L(c)$ .
- 6.4** (c) Find this as a Möbius transformation (preserving the real line). Use that Möbius transformations take lines and circles to lines and circles and preserve angles.