Geometry Homework 1

B96201044 黃上恩, *B98901182* 時丕勳, *K0020100x* 劉士瑋

September 18, 2011

Problem 1 (P7: 4). *Let* $\alpha : (0, \pi) \to \mathbf{R}^2$ *be given by*

$$\alpha(t) = \left(\cos t, \cos t + \log \tan \frac{t}{2}\right),$$

where t *is the angle that the* y *axis makes with the vector* $\alpha(t)$*. The trace of* α *is called the* tractrix *(Fig. 1-9). Show that*

(a) α *is a differentiable parametrized curve, regular except at* $t = \pi/2$*.*

(b) The length of the segment of the tangent of the tractrix between the point of tangency and the y *axis is constantly equal to* 1*.*

Proof. This is the proof. □

Problem 2 (Curvature is a geometric object I.). *haha*