HW3
5500 Spring 2012

Andrej Cherkaev

1. Assume that Dido and her people land on a circular island, its diameter is equal to R. Solve Dido problem at a shore of that island, assuming that the length of the rope is smaller than $2\,R$.

2. A heavy chain of the length $L = 4$ is hanged over a floor $h = 0$, a part of the chain lies on a floor. The coordinates of the supports are $h = 1, x = 0$ and $h = 1, x = 1$. Find a position of equilibrium of the chain.

3. Derive equations for geodesics on a circular cone $z = a\,r$, where z and r are cylindrical coordinates, and a is a positive real parameter. Find a distance between points $(r = 1, z = a, \theta = 0)$ and $(r = 2, z = 2a, \theta = \pi)$. Use cylindrical coordinates.