Math 303, Fall 2008
Assignment for Dec. 07-17

- Read pages 775-782 and 785-790 of the textbook (Riley-Hobson-Bence, 3rd Edition).
- Solve Problems 22.1 and 22.2 on page 797 of the textbook.
- Solve the following problems.

1. Find the stationary points of the functionals $\mathcal{F}$ and $\mathcal{G}$ defined by

$$\begin{aligned} \mathcal{F}[y(x)] &:= \int_a^b \sqrt{1+\frac{y'^2}{y^2}}\,dx, \\ \mathcal{G}[y(x)] &:= \int_a^b \frac{\sqrt{1+y'^2}}{1+y}\,dx, \end{aligned}$$

2. Let S be the surface of revolution of the curve $z = x^2$ about z-axis. Find the differential equation determining the geodesics on S and obtain its solution.