

Homework for Physics 456/656

Introduction to Accelerator Physics and Technology (Hoffstaetter)

Due Date: Thursday, 10/16/03 - 11:40 in 110 Rockefeller Hall

**Exercise 1:**

Determine the thin lens approximation for a combined function magnet with quadrupole strength  $k$  and curvature  $\kappa$

**Exercise 2:(a)** Determine the transport matrix for a solenoid in the sharp cutoff limit. It has the length  $L$ , and the longitudinal field strength on axis is  $B_z$  for  $x \in [0, L]$  and 0 outside this region. As solenoid strength you can use the parameter  $g = \frac{qB_z}{2p}$ .

**(b)** Determine the thin lens approximation of this solenoid.