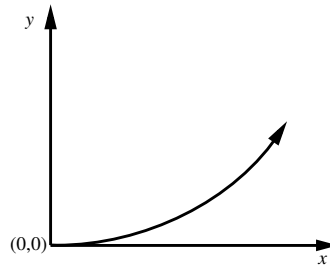


Phys 203 - Princeton University - Fall 2006 - Homework # 2

Due October 4th by 5 PM in Prof. Romalis mailbox on the first floor of Jadwin

1. The Fermat principle states that light always propagates along a path that takes the minimum amount of time. Consider a medium with an index of refraction given by $n(x, y) = n_0(1 + ky)$. Recall that the speed of light in a medium with index n is given by $v = c/n$. Find the function that describes the path of light in this medium. Determine a specific equation for the path of a laser beam that initially starts at the origin propagating in the \hat{x} direction, as shown in the figure.



2. Problem 6.3 from Thornton and Marion
3. Problem 6.14 from Thornton and Marion
4. It is well-known that the shape of a closed string loop of length L that encloses the largest area on a flat surface is a circle. Prove it without making any initial assumptions about the shape.