Hwmk 3

Math 528 Summer Session 1

Due 5/25 (Tuesday at 11:59 pm)

1 Chains on the Brain

If you have a string like material hanging between two points and the material is approximately inflexible and homogeneous such as: a cable between power lines, a iron cable of a suspension bridge, or the thread of a spider web, they are called catenarys. The shape of the catenarys are modeled by the solutions to the ODE: $S'' = \sqrt{1 + (S')^2}$

(a) [2 points] Solve the ODE by reducing the order

(b) [2 points] If the fixed points are at (-1,0) and (1,0), what is the lowest position of the catenary?

(c) [2 points] If the fixed points are at (-1,0) and (1,1), what is the lowest position of the catenary?

2 What is the Question?

(a) [4 points] Textbook page 79 problems 9-10