Math 250b (Spring '08) - Homework 1 extra problem

1. Consider the region bounded by the x and y axes and the curve $1/(x+1)$. (The region extends infinitely far in the positive x direction.) We rotate this region about the x axis.

a. Show that this infinitely long solid has a finite volume and find the volume.

b. Show that the solid has infinite surface area. This is a challenge since we never computed any surface areas. But you can do it by slicing and thinking about the surface area of a slice.

Note that this solid has the strange property that you cannot paint it since it has infinite surface area, but you can fill it with paint since it has finite volume.