1. (10pts) A 2D surface is embedded into Minkowski space with metric $ds^2 = -dt^2 + dx^2 + dy^2 + dz^2$ by the following embedding function: $\{t, x, y, z\} = \{\cosh(u), \sin(v), \sinh(u), \cos(v)\}$. Calculate the Ricci scalar for this 2D space.
2. (10pts) The Poincare half-plane is a 2D maximally symmetric space which in coordinates \((r, \theta)\) has the metric 
\[
d s^2 = \frac{dr^2}{(r \ln r)^2} + \frac{d\theta^2}{(\ln r)^2}.
\]

a) How many independent solutions to Killing’s equation would we expect for this space?
b) If \(R_{r\theta r} = \frac{1}{r^2 (\ln r)^4}\), calculate \(R\).