

Your Name: _____

Let S be the surface parametrized by

$$\vec{x}(u, v) = (2u, \sinh(u) \cos(v), \sinh(u) \sin(v)), \quad (u, v) \in (0, \infty) \times (-\infty, \infty)$$

where the function $\sinh(u) = \frac{e^u - e^{-u}}{2}$ is the hyperbolic sine. (The identity

$$\cosh^2(u) - \sinh^2(u) = 1$$

may be useful!)

(A) (5) Compute the coefficients E, F, G of the first fundamental form.

(B) (10) Compute the coefficients e, f, g of the second fundamental form.

(C) (5) Find the Gaussian curvature of S (as a function of u, v).