

Your Name: \_\_\_\_\_

Let  $S$  be the surface parametrized by

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

where the function  $\cosh(u) = \frac{e^u + e^{-u}}{2}$  is the hyperbolic cosine.

(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  $u, v$ ).