

Answer on Question #77265, Math / Geometry

$$\sigma(u, v) = (\sinh u \cdot \sinh v, \sinh v, \sinh u \cdot \cosh v, \sinh u)$$

$$\frac{\partial \sigma}{\partial u} = (\cosh u \cdot \sinh v, 0, \cosh u \cdot \cosh v, \cosh u)$$

$$\frac{\partial \sigma}{\partial v} = (\sinh u \cdot \cosh v, \cosh v, \sinh u \cdot \sinh v, 0)$$

$$E = \cosh^2 u \cdot \sinh^2 v + \cosh^2 u \cdot \cosh^2 v + \cosh^2 u = 2 \cosh^2 u \cdot \cosh^2 v$$

$$F = 2 \sinh u \cdot \cosh u \cdot \sinh v \cdot \cosh v$$

$$G = \sinh^2 u \cdot \cosh^2 v + \cosh^2 v + \sinh^2 u \cdot \sinh^2 v$$

Then,  $1(x, y) = Ex^2 + 2Fxy + Gy^2$

$$\sigma(u, v) = (u - v, u + v, u^2 + v^2)$$

$$\frac{\partial \sigma}{\partial u} = (1, 1, 2u)$$

$$\frac{\partial \sigma}{\partial v} = (-1, 1, 2v)$$

$$E = 2 + 4u^2$$

$$F = 4uv$$

$$G = 2 + 4v^2$$

Then,  $1(x, y) = Ex^2 + 2Fxy + Gy^2$