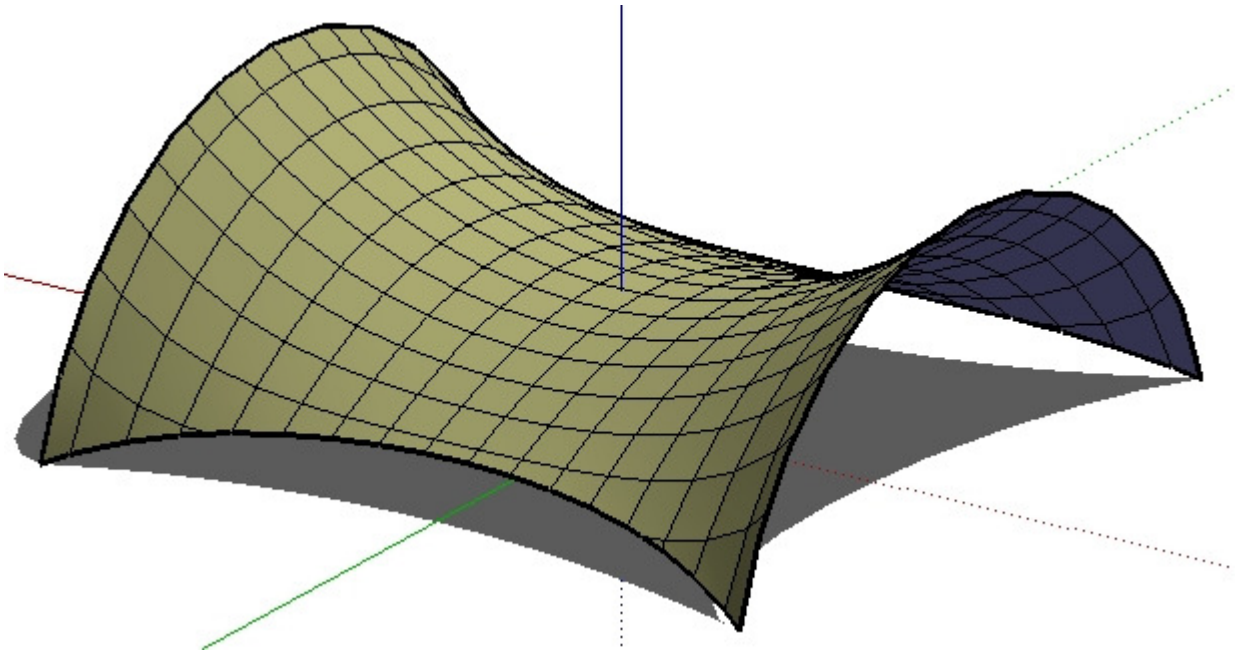
Saddle surface: $z = y^2 - x^2 + 1$



Source: www.tensile-structures.de/.../SaddleSurface.jpg

Note that the intersection of this surface with the yz – plane is the upward parabola $z = y^2 + 1$, while the intersection of this surface with the xz – plane is the downward parabola $z = 1 - x^2$. This surface is a typical example in which the Gaussian curvature is negative, and the behavior at the origin reflects this fact particularly well.