Quadric Surfaces!

Cone (implicit) via cross sections (traces)
\[ z^2 = x^2 + y^2 \]

Cylinder (implicit) via cross sections (traces)
\[ x^2 + y^2 = 4; z \text{ unrestricted} \]

Ellipsoid (implicit) via cross sections (traces)
\[ \frac{x^2}{3} + \frac{y^2}{4} + \frac{z^2}{5} = 1 \]

Hyperboloid of one sheet (implicit) via cross sections (traces)
\[ \frac{x^2}{3} + \frac{y^2}{4} - \frac{z^2}{9} = 1 \]

Paraboloid (implicit) via cross sections (traces)
\[ z = \frac{x^2}{4} + \frac{y^2}{4} \]