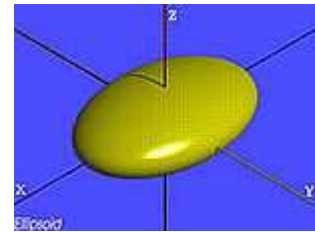


Non-degenerate quadric surfaces

[Ellipsoid](#)

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$$



[Spheroid](#) (special case of ellipsoid)

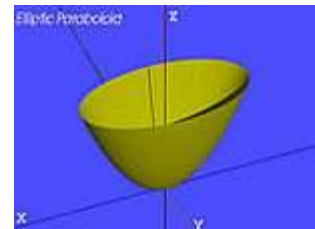
$$\frac{x^2}{a^2} + \frac{y^2}{a^2} + \frac{z^2}{b^2} = 1$$

[Sphere](#) (special case of spheroid)

$$\frac{x^2}{a^2} + \frac{y^2}{a^2} + \frac{z^2}{a^2} = 1$$

Elliptic [paraboloid](#)

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - z = 0$$

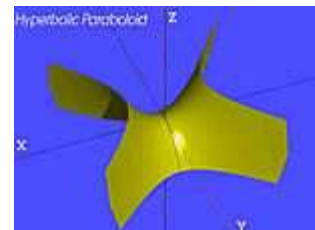


Circular [paraboloid](#) (special case of elliptic paraboloid)

$$\frac{x^2}{a^2} + \frac{y^2}{a^2} - z = 0$$

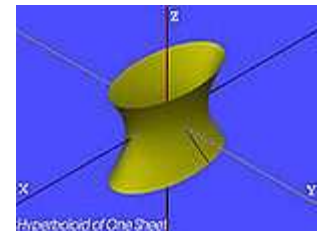
Hyperbolic [paraboloid](#)

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} - z = 0$$



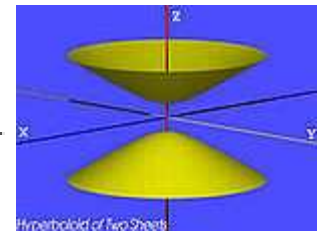
Hyperboloid of one sheet

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$$



Hyperboloid of two sheets

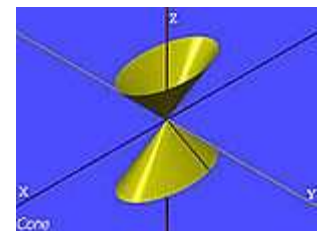
$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = -1$$



Degenerate quadric surfaces

Cone

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 0$$

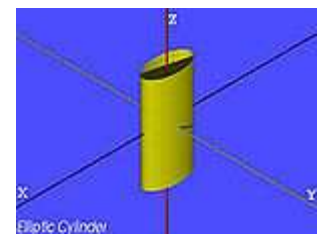


Circular Cone (special case of cone)

$$\frac{x^2}{a^2} + \frac{y^2}{a^2} - \frac{z^2}{c^2} = 0$$

Elliptic cylinder

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$

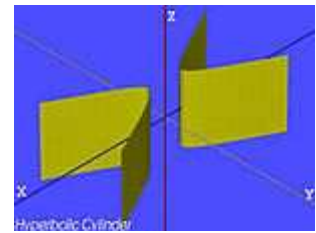


Circular cylinder (special case of elliptic cylinder)

$$\frac{x^2}{a^2} + \frac{y^2}{a^2} = 1$$

Hyperbolic [cylinder](#)

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$



Parabolic [cylinder](#)

$$x^2 + 2ay = 0$$

