

Surfaces in Space:

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

Ellipsoid

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

Hyperboloid of One Sheet

Axis of the hyperboloid is z-axis because coefficient the variable z is negative.

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

Hyperboloid of Two Sheet

Axis of the hyperboloid is z-axis because coefficient the variable z is positive.

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

Elliptic Cone

Axis of the cone is z-axis because coefficient the variable z is negative.

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

Elliptic Paraboloid

Axis of the paraboloid is z-axis because the variable z is raised to the first power.

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

Hyperbolic Paraboloid

Axis of the paraboloid is z-axis because the variable z is raised to the first power.