




Quadric Surfaces


1. $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$ \rightarrow  Ellipsoid
Cross sections are Ellipses

2. $\frac{z}{c} = \frac{x^2}{a^2} + \frac{y^2}{b^2}$ \rightarrow  Elliptic Paraboloid
Cross sections are Ellipses and parabolas

3. $\frac{z}{c} = \frac{x^2}{a^2} - \frac{y^2}{b^2}$ \rightarrow "Saddle" Hyperbolic Paraboloid
Cross sections are Hyperbolas and parabolas

4. $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$ \rightarrow  Hyperboloid of one sheet
Cross sections are Hyperbolas and Ellipses

5. $\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = -1$ \rightarrow  Hyperboloid of two sheets
Cross sections are Hyperbolas and Ellipses

6. $\frac{z^2}{c^2} = \frac{x^2}{a^2} + \frac{y^2}{b^2}$ \rightarrow  Cone (Double)
Cross sections are Ellipses and lines.